

MISSOURI HIGHWAYS and TRANSPORTATION COMMISSION

JEFFERSON CITY, MISSOURI

SUPPLEMENTAL PLANS TO OCTOBER 2009 MISSOURI STANDARD PLANS FOR HIGHWAY CONSTRUCTION

EFFECTIVE July 1, 2015

SHEET 1 OF 2

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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E COLLARS	2	10/01/2000
TTED DRAIN	2	03/01/1994
EMENT UNDERDRAINAGE **	4	06/01/2013
ARDRAIL *	8	08/01/2012
)IAN PIER PROTECTION *	9	08/01/2012
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-STRAND ACCESS RESTRAINT CABLE	2	07/01/2004
REE-STRAND GUARD CABLE **	7	01/01/2005
AIN-LINK FENCE	1	02/01/2007
	1	06/01/2009
AIN-LINK FENCE FOR RETAINING WALLS	2	10/01/1998
P C E T E	INLET - TYPE X RETE MANHOLES COLLARS TED DRAIN MENT UNDERDRAINAGE ** RORAIL ** IAN PIER PROTECTION ** DGE ANCHOR SECTION - SAFETY BARRIER CURB ON BRIDGE ** RORAIL (TERMINAL ENDS CRASHWORTHY) ** -STRAND ACCESS RESTRAINT CABLE EE-STRAND GUARD CABLE ** IN-LINK FENCE	INLET - TYPE X RETE MANHOLES COLLARS COLLARS 2 TED DRAIN MENT UNDERDRAINAGE * 4 RORAIL * 8 IAN PIER PROTECTION GE ANCHOR SECTION - SAFETY BARRIER CURB ON BRIDGE * 5 ROGE ANCHOR SECTION (THRIE BEAM RAIL ON BRIDGE) * 5 RORAIL (TERMINAL ENDS CRASHWORTHY) * 8 -STRAND ACCESS RESTRAINT CABLE EE-STRAND GUARD CABLE * 7 IN-LINK FENCE 1 IN-LINK FENCE FOR RETAINING WALLS

ONTENTS			
STANDARD NO.	DRAWING TITLE	NO. OF SHEETS	EFFECTIVE DATE
608.00H	PAVED APPROACHES	2	10/01/2009
608.10P	CONCRETE SIDEWALK *	1	04/01/2015
608.20E	CONCRETE STAIRS *	2	04/01/2015
608.30A	CONCRETE MEDIAN STRIP *	1	02/01/2011
608.40	HANDRAILING *	4	04/01/2015
608.50	CURB RAMPS *	4	04/01/2015
609.00P	CONCRETE CURB, CURB AND GUTTER AND GUTTER *	2	08/01/2008
609.15C	PAVED DITCHES	1	03/01/1993
609.400	DRAIN BASIN. SHOULDER PAVING AND FILL SLOPES AT BRIDGE ENDS *	3	07/01/2015
609.60C	ROCK DITCH LINER	1	03/01/1993
609.70C	ROCK LINING FOR CULVERT OUTLET	1	10/01/1981
611.60R	CONCRETE SLOPE PROTECTION *	1	07/01/2015
612.20D	SAND FILLED IMPACT ATTENUATORS	1	08/01/2008
613.00P	PAVEMENT REPAIR *	3	06/01/2010
614.10T	GRATES AND BEARING PLATES	1	12/01/2005
614.11C	CURVED VANE GRATE AND FRAME *	1	06/01/2010
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616.10AQ	TEMPORARY TRAFFIC CONTROL DEVICES *	8	08/01/2012
617.10H	PERMANENT CONCRETE TRAFFIC BARRIER *	12	08/01/2012
617.20C	TEMPORARY CONCRETE TRAFFIC BARRIER	6	06/01/2008
619.10G	PAVEMENT EDGE TREATMENT *	1	05/01/2012
620.00J	PAVEMENT MARKING *	5	12/01/2009
620,10C	TEMPORARY PAVEMENT MARKING **	4	07/01/2011
620.20	SNOWPLOWABLE RAISED PAVEMENT MARKERS	4	01/01/2003
625.00	HOLE PATTERN FOR PAVEMENT SLAB STABILIZATION	1	10/01/1998
626.00H	RUMBLE STRIPS	2	04/01/2009
702.02F	CAST-IN-PLACE CONCRETE PILES (APPROVED TYPES)	1	07/01/2004
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EFFECTIVE: 07/01/2015

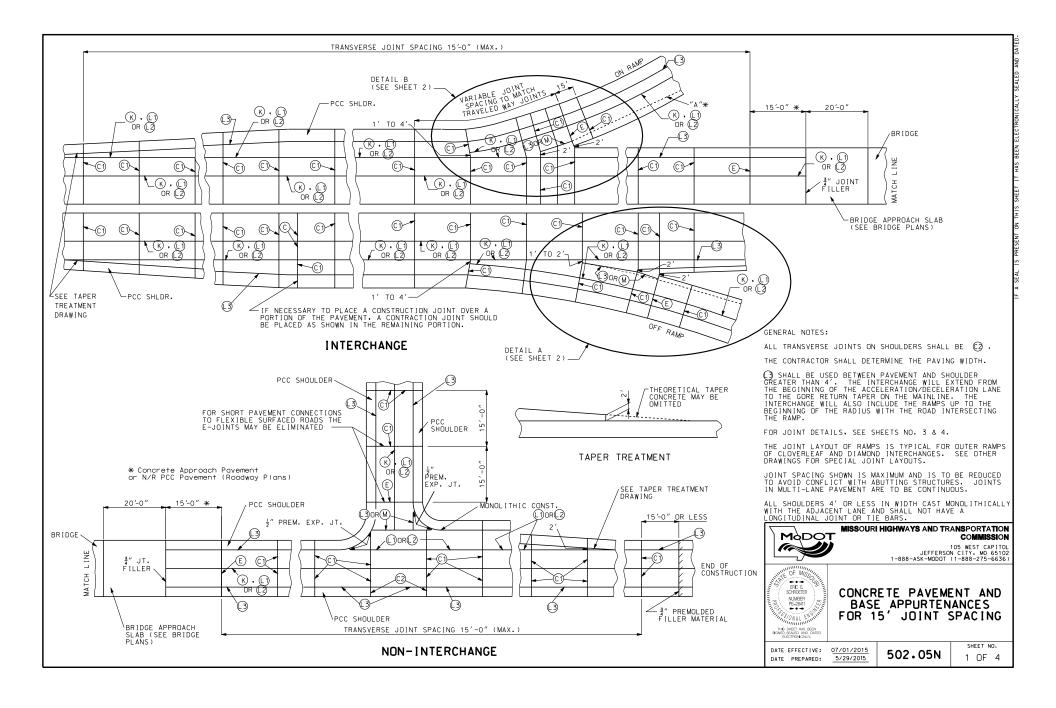
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

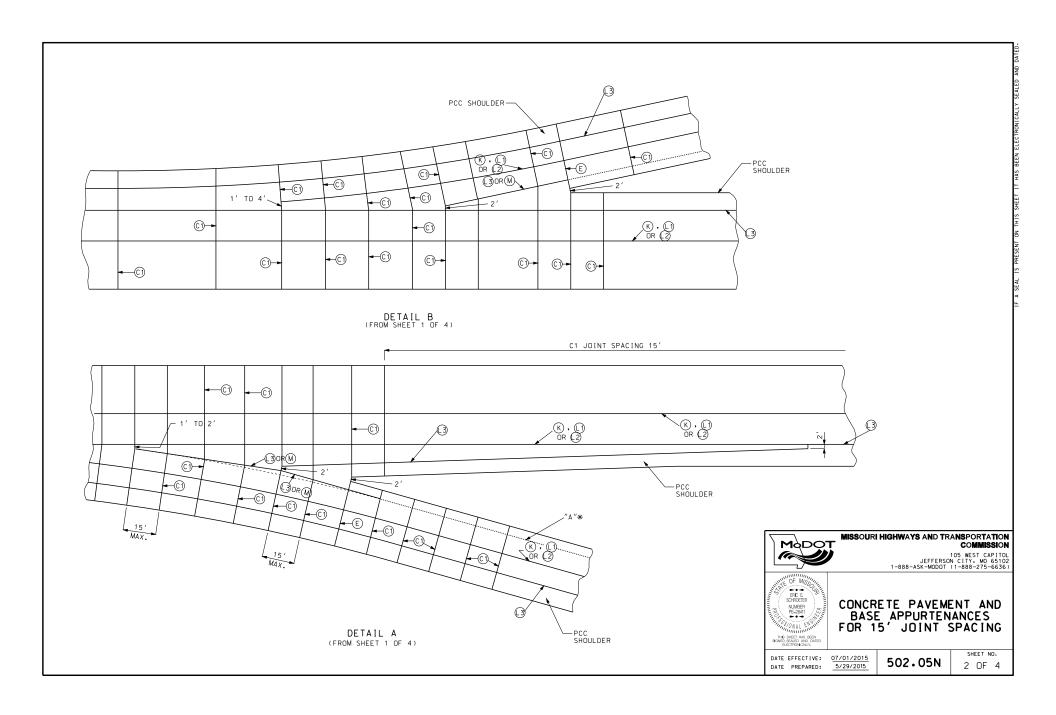
MISSOURI STANDARD PLANS FOR HIGHWAY CONSTRUCTION

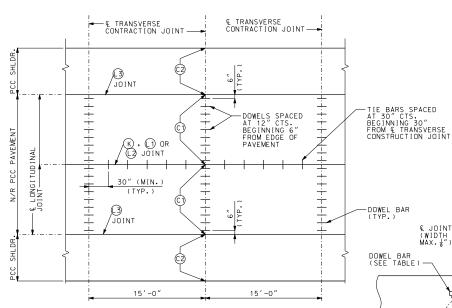
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703.10J	CONCRETE SINGLE BOX CULVERT - STRAIGHT WINGS (SQUARED)	*	3	07/01/2015
703.11J	CONCRETE SINGLE BOX CULVERT - FLARED WINGS (SQUARED)	*	3	07/01/2015
703.12J	CONCRETE SINGLE BOX CULVERT - STRAIGHT WINGS (LEFT ADVANCE)	*	3	07/01/2015
703.13J	CONCRETE SINGLE BOX CULVERT - FLARED WINGS (LEFT ADVANCE)	*	3	07/01/2015
703.14J	CONCRETE SINGLE BOX CULVERT - STRAIGHT WINGS (RIGHT ADVANCE)	*	3	07/01/2015
703.15E	CONCRETE SINGLE BOX CULVERT - FLARED WINGS (RIGHT ADVANCE)	*	3	07/01/2015
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725.00C	CORRUGATED METAL PIPE INSTALLATION METHODS	*	5	04/01/2011
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901.00AA	HIGHWAY LIGHTING - POLES, FOUNDATIONS & APPURTENANCES FOR 45' M.H.	*	6	12/01/2013
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201.201	TOWNER PROFITED CONTINUE STATION		+	107/01/2003

STANDARD	DRAWING TITLE			EFFECTIVE
NO.			SHEETS	
901.80D	HIGHWAY LIGHTING - POWER SUPPLY ASSEMBLY - SECONDARY SERVICE		2	04/01/2002
901.85A	HIGHWAY LIGHTING SYMBOLS		1	01/01/2003
902.00N	TRAFFIC SIGNALS - SIGNAL HEAD MOUNTING	*	2	07/01/2015
902.100	TRAFFIC SIGNALS - CONTROLLERS CONDUIT LOCATION		1	04/01/2005
902.15K	TRAFFIC SIGNALS - POWER SUPPLY ASSEMBLY		3	07/01/2004
902.20G	TRAFFIC SIGNALS - CONCRETE PULL BOXES	*	3	11/01/2010
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902.400	TRAFFIC SIGNALS - TUBULAR STEEL POSTS	*	3	02/01/2008
902.50L	TRAFFIC SIGNALS - INDUCTION LOOP DETECTORS		2	06/01/2009
902.70P	TRAFFIC SIGNALS - RIGID SPAN WIRE DETAILS		2	02/01/2008
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903.02AL	HIGHWAY SIGNING STRUCTURAL SIGNS	*	19	02/01/2012
903.03BH	SIGN MOUNTING DETAILS	*	11	02/01/2012
903.04F	HIGHWAY SIGNING - WEIGH STATION	*	1	02/01/2012
903.05H	HIGHWAY SIGNING - TUBULAR SUPPORT STEEL - TYPE S. ONE TUBE		2	04/01/2005
903.06Н	HIGHWAY SIGNING - TUBULAR SUPPORT STEEL - TYPE S. TWO TUBE		2	04/01/2005
903.07H	HIGHWAY SIGNING - TUBULAR SUPPORT STEEL - TYPE C		2	04/01/2005
903.08G	HIGHWAY SIGNING - TUBULAR SUPPORT STEEL - TYPE B		2	04/01/2005
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903.60AA	OVERHEAD SIGN TRUSSES - STRUCTURAL STEEL	*	5	10/01/2011
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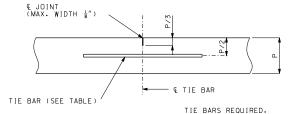






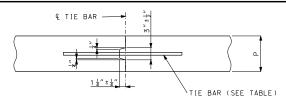
JOINT PLAN AND SPACING FOR CONTRACTION JOINTS

(1) LONGITUDINAL JOINT NOT REQUIRED AT INSIDE SHOULDER ON DIVIDED HIGHWAYS OR AT INSIDE SHOULDER OF RAMPS. FOR 4' OR LESS INSIDE SHOULDERS, DOWELS ARE REQUIRED FOR THE FIRST TWO FEET ADJACENT TO THE TRAVEL LANE.



LONGITUDINAL JOINT (1)

TIE BAR AND DOWEL TABLE					
PCCP THICKNESS (P)	DOWEL SIZE	TIE BAR SIZE	DOWEL SPACING	TIE BAR SPACING	
LESS THAN 7"	NONE	#5 X 3 0 "	NONE	30" CTRCTR.	
7" TO 10"	1 ¼″X18″	#5 X 3 0 "	12" CTRCTR.	30" CTRCTR.	
GREATER THAN 10"	1 ½"X18"	#6X40"	12" CTRCTR.	30" CTRCTR.	



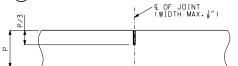
IF METAL IS USED TO FORM KEY DISCONTINUE STRIP FOR DISTANCE OF APPROXIMATELY 3" EACH SIDE OF TRANSVERSE JOINT.

TYPE (K) REQUIRES TIE BAR.

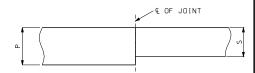
TYPE (M) CONSTRUCTED WITHOUT TIE BARS.

(AND M JOINTS SHALL NOT BE SAWED.

TONGUE AND GROOVE JOINTS (K) AND (M)



TRANSVERSE CONTRACTION JOINT(2)



LONGITUDINAL CONSTRUCTION JOINT FOR SHOULDER 3

S = SHOULDER THICKNESS

GENERAL NOTES:

THE FINAL POSITION OF ALL DOWELS AND TIE BARS SHALL BE PERPENDICULAR TO THE PLANE OF THE JOINT AND PARALLEL TO THE SURFACE OF THE PAVEMENT AND PARALLEL TO FACH OTHER.

(3) JOINT FOR FULL DEPTH OR PARTIAL DEPTH SHOULDERS.



CONCRETE PAVEMENT AND

MISSOURI HIGHWAYS AND TRANSPORTATION

105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)

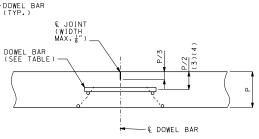
BASE APPURTENANCES FOR 15' JOINT SPACING YONAL ENG THIS SHEET HAS BEEN SIGNED SEALED AND DATE ELECTRONICALLY.

DATE EFFECTIVE: 07/01/2015 DATE PREPARED:

502.05N

SHEET NO. 3 OF 4

COMMISSION



DOWELS REQUIRED. FOR PERMISSIBLE TYPES OF DOWELS SUPPORTING UNITS. SEE OTHER DRAWINGS.

TRANSVERSE CONTRACTION JOINTS FOR CONCRETE PAVEMENT OR BASE WIDENING SHALL MATCH EXISTING JOINTS.

TRANSVERSE CONTRACTION JOINT (C1)

- (2) DOWEL BARS ARE REQUIRED FOR ALL PAVEMENTS HAVING THE

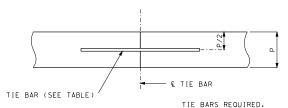
- SAME THICKNESS AS THE TRAVELED WAY:

 (3) FOR PAVENENTS HAVING THICKNESS IN 1/2" INCREMENTS.

 DOWEL BASKETS SHALL BE P/2 1/2"

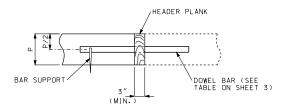
 (4) DOWEL BASK MAY BE PLACED BY MECHANICAL MEANS AT THE

 OPTION OF THE CONTRACTOR.

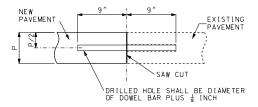


LONGITUDINAL CONSTRUCTION JOINT

PART ELEVATION OF HEADER PLANK



HEADER SECTION



SAWED SECTION

THE HEADER BOARD SHALL BE SUFFICIENTLY RIGID TO PREVENT DISTORTION FROM THE TYPICAL SECTION AND MAINTAIN A STRAIGHT LINE FROM PAVEMENT EDGE TO PAVEMENT EDGE.

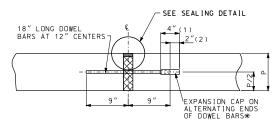
THE CONSTRUCTION JOINT MAY BE SAWED FULL DEPTH. HOLES FOR DOWEL BARS SHALL BE DRILLED AFTER THE CONCRETE HAS SUFFICIENT SET TO PREVENT DAMAGE. DOWEL BARS SHALL BE BONDED INTO THE HOLES.

BONDING FOR DOWEL BARS SHALL BE EPOXY OR POLYESTER BONDING AGENTS AS SPECIFIED IN SECTION

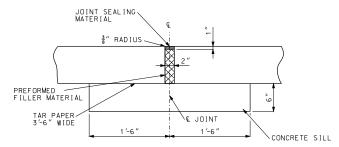
THE PORTION OF THE DOWEL OUTSIDE THE HOLE SHALL BE COATED WITH AN APPROVED LUBRICANT.

CONSTRUCTION JOINT (C)



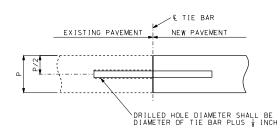


EXPANSION JOINTS (E)



SILL SHALL EXTEND 18" BEYOND EACH EDGE OF THE PAVEMENT AND SHALL BE CONSTRUCTED OF CONCRETE REGARDLESS OF ADJACENT BASE MATERIAL.

ALTERNATE EXPANSION JOINTS(E) (CONTRACTOR MAY SELECT EITHER EXPANSION JOINT (E)



TIE BARS SHALL BE EPOXY COATED, DEFORMED REINFORCING BARS MEETING THE REQUIREMENTS OF SECTIONS 710 AND 1057.

BONDING FOR TIE BARS SHALL BE EPOXY OR POLYESTER BONDING AGENTS AS SPECIFIED IN SECTION 1039.

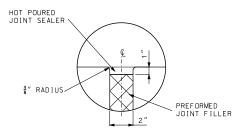
TIE BAR SIZE AND LENGTH SHALL BE BASED ON THE THICKNESS OF THE THINNER PAYEMENT OR SHOULDER TO BE TIED TOGETHER.

LONGITUDINAL CONSTRUCTION JOINT (EXISTING PAVEMENT)

(1) LENGTH OF CAP

(2) GAP BETWEEN END OF CAP AND DOWEL.

** FOR EXPANSION JOINTS FORMED USING A CONSTRUCTION HEADER. THE EXPANSION CAPS SHALL BE INSTALLED ON THE EXPOSED END OF EACH BAR ONCE THE HEADER HAS BEEN REMOVED AND THE JOINT FILLER MATERIAL HAS BEEN INSTALLED.



SEALING DETAIL

MODOT (Ca)

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)

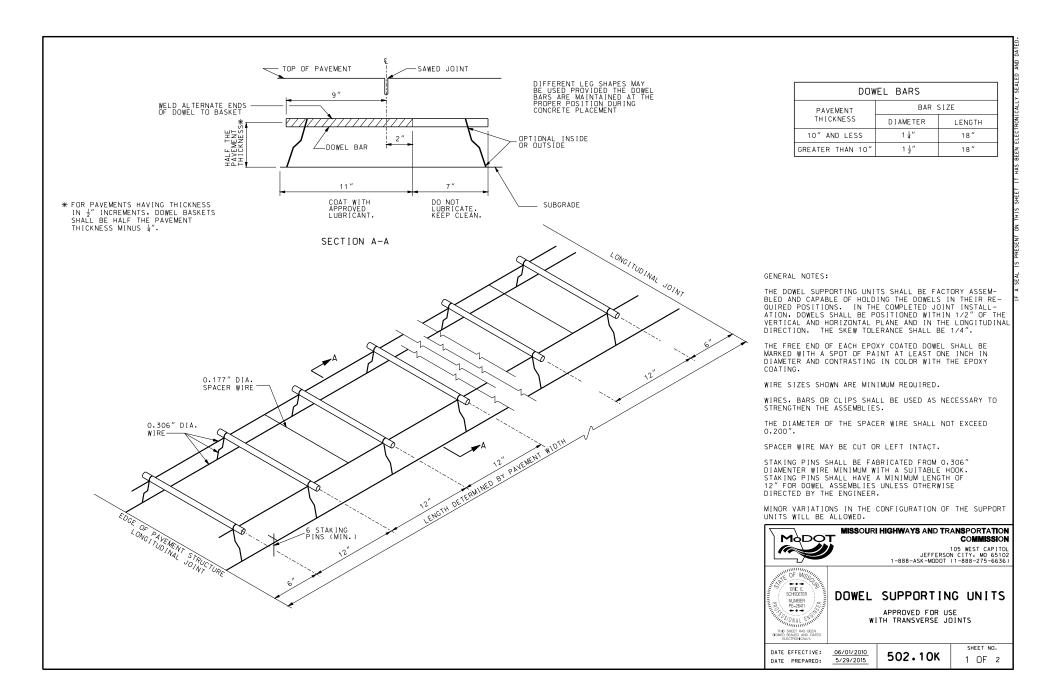


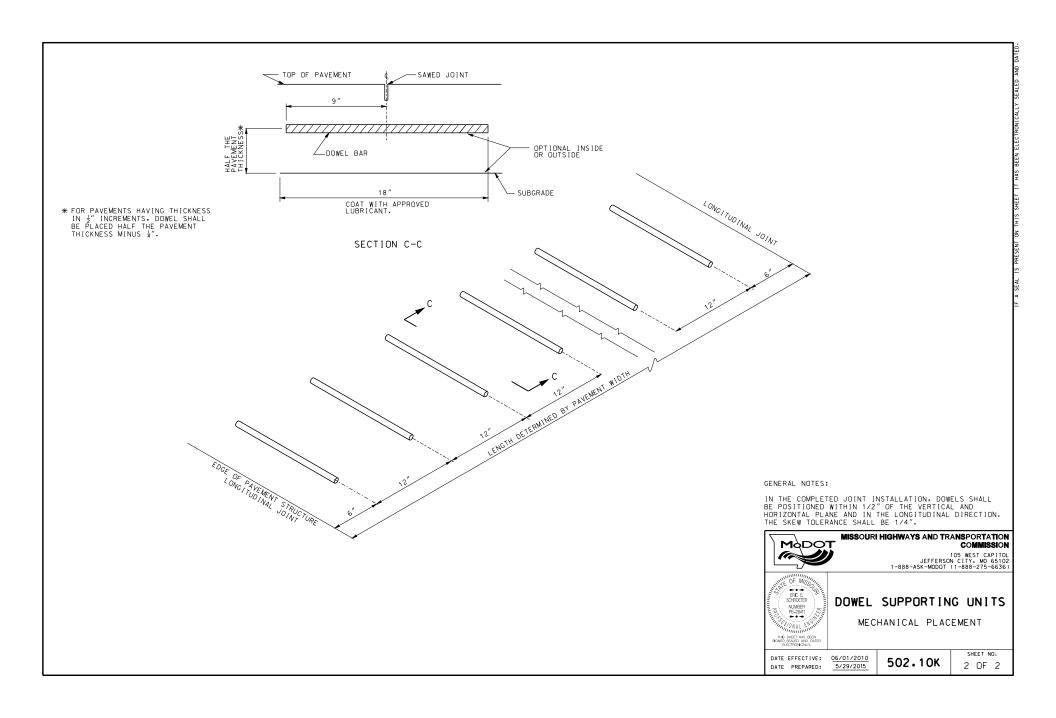
CONCRETE PAVEMENT AND BASE APPURTENANCES FOR 15' JOINT SPACING

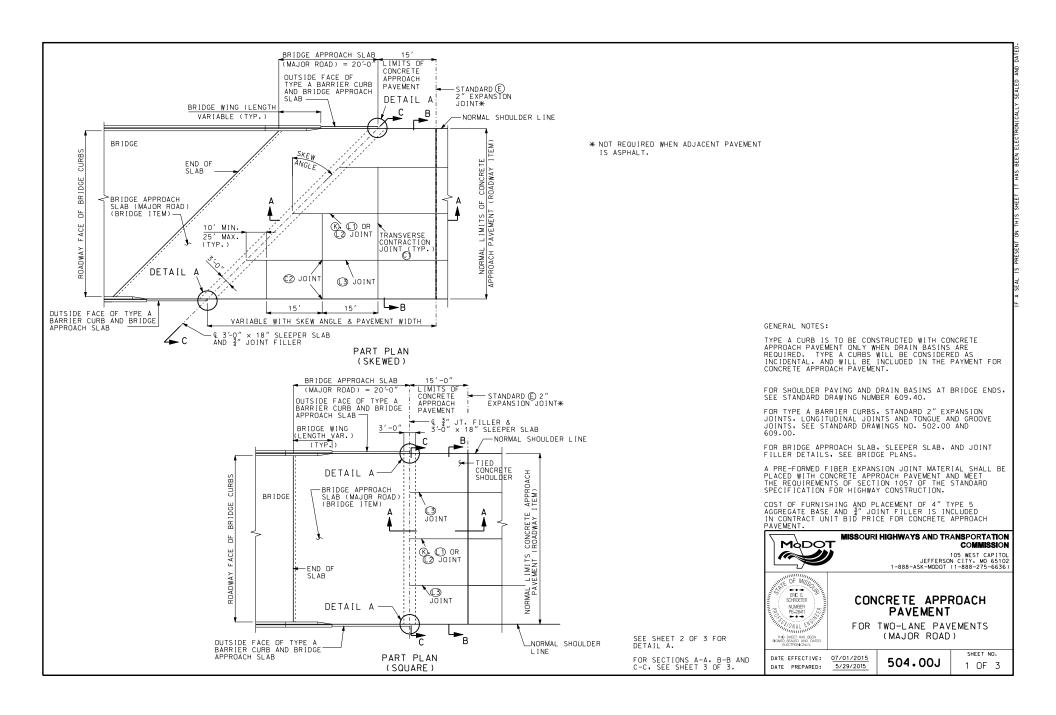
DATE EFFECTIVE: 07/01/2015 DATE PREPARED:

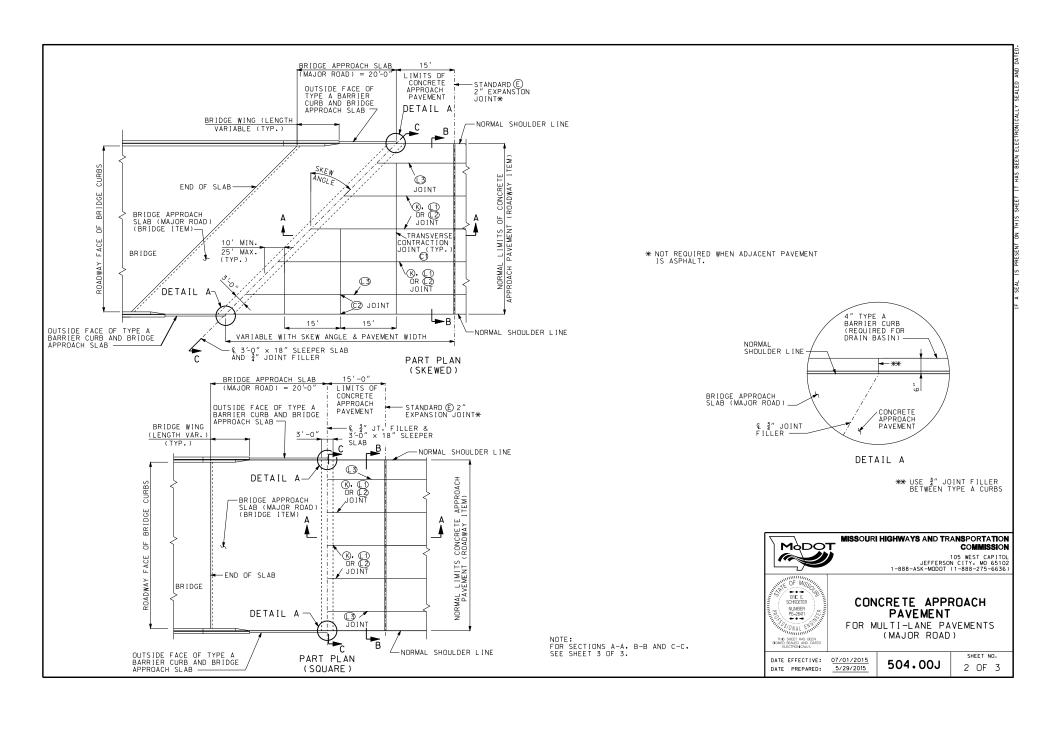
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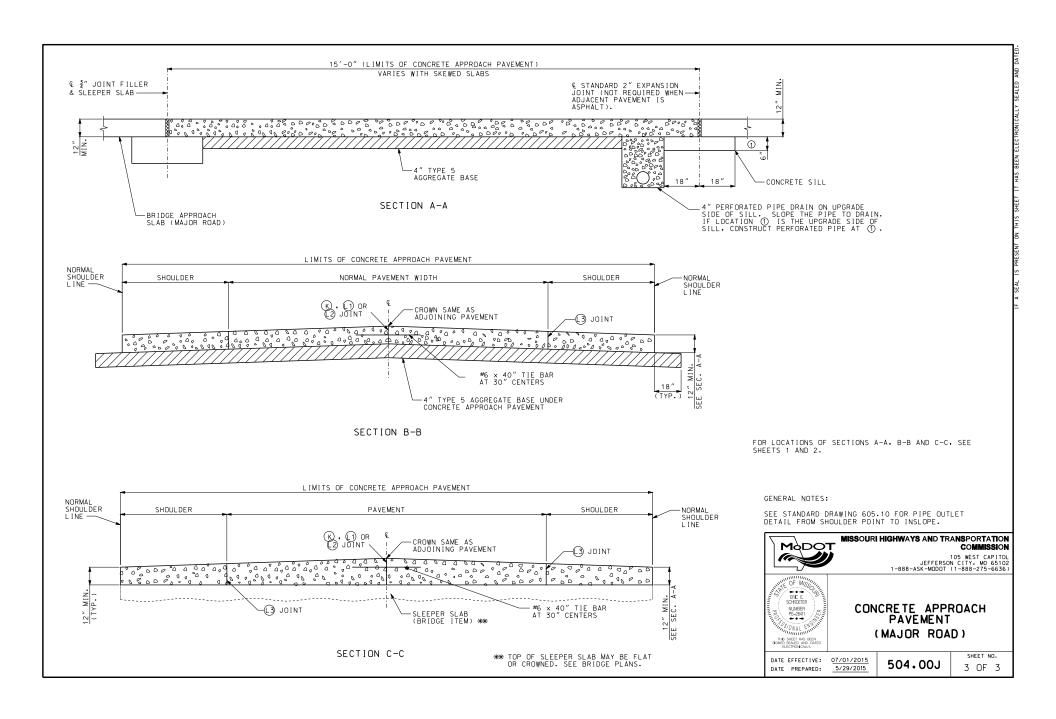
SHEET NO. 4 OF 4

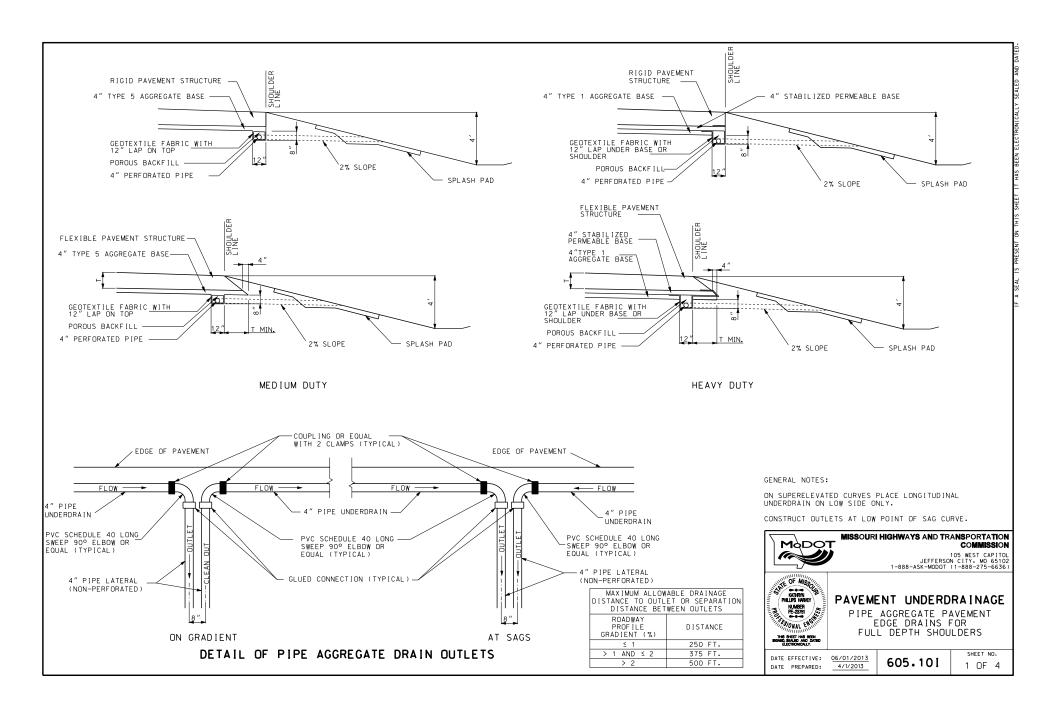


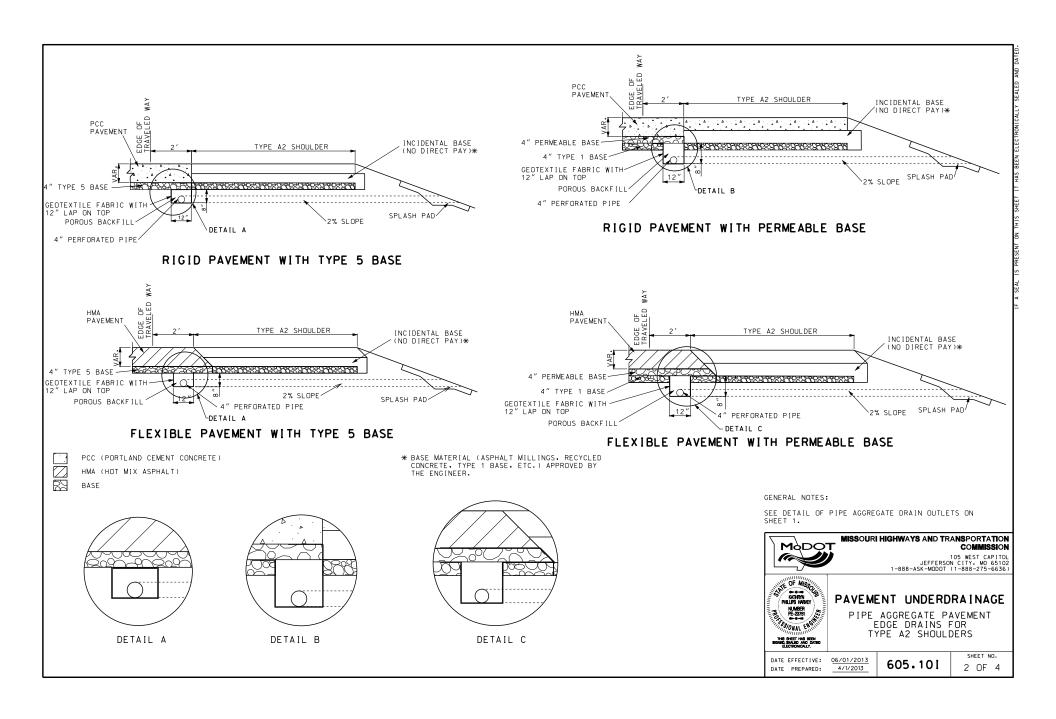


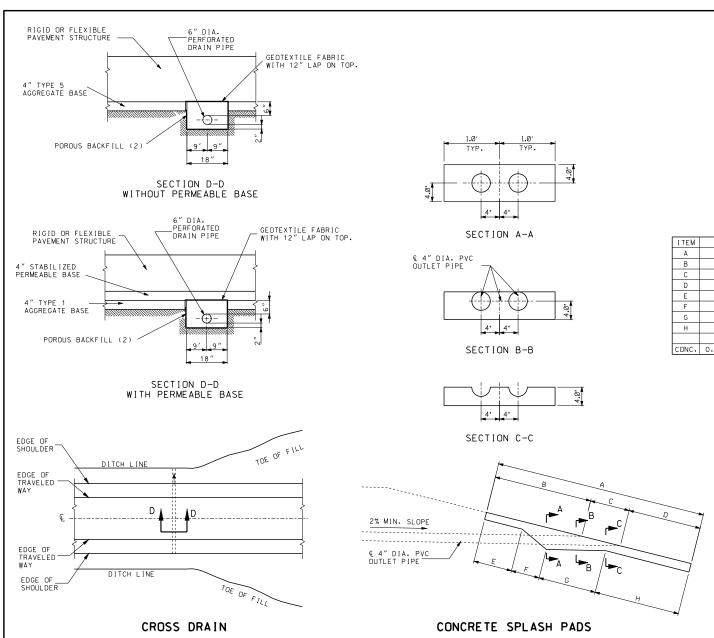


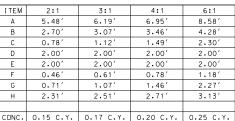












GENERAL NOTES:

PRECAST CONCRETE SPLASH PADS MAY BE INSTALLED AS APPROVED BY THE ENGINEER.

TOP OF SPLASH PAD SHALL MATCH EXISTING CROSS SLOPE. CONSTRUCT BEND IN SPLASH PAD WHERE CROSS SLOPE CHANGES.

DIMENSIONS ARE APPROXIMATE AND CAN BE ADJUSTED AS DIRECTED BY THE ENGINEER.



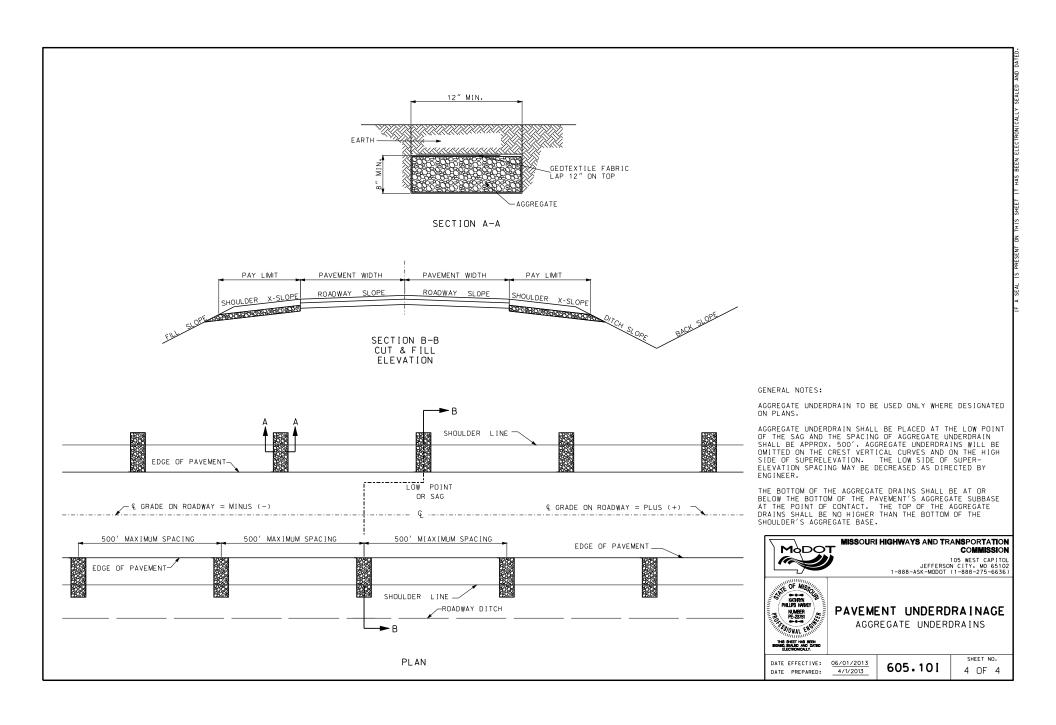


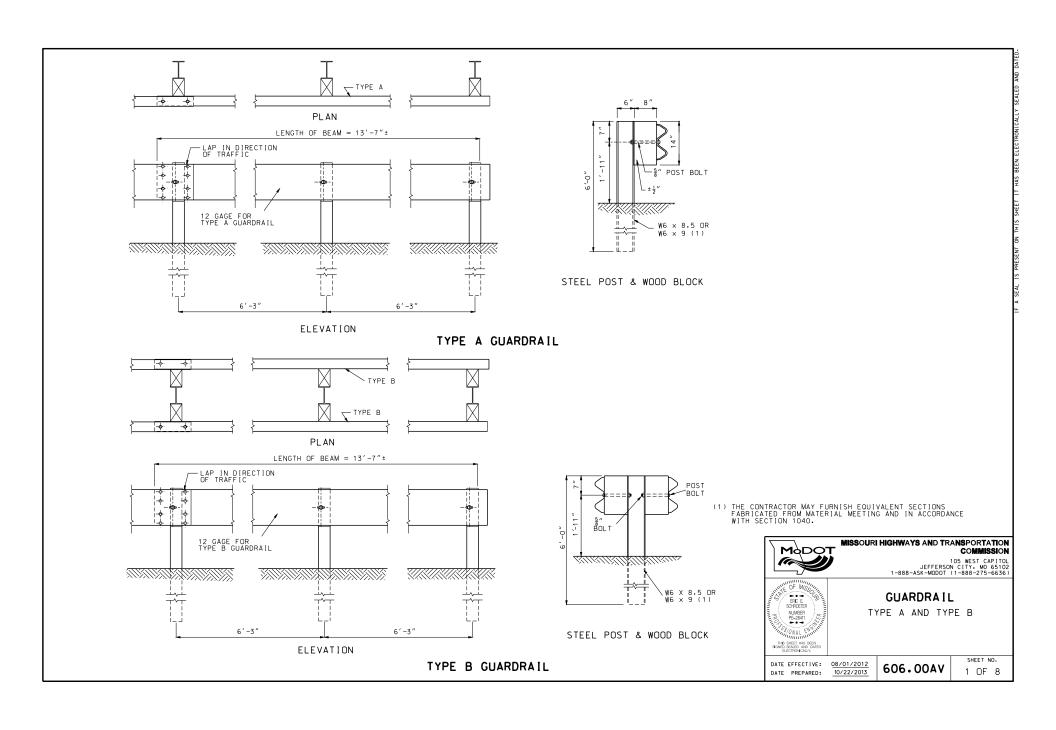
PAVEMENT UNDERDRAINAGE CROSS DRAINS

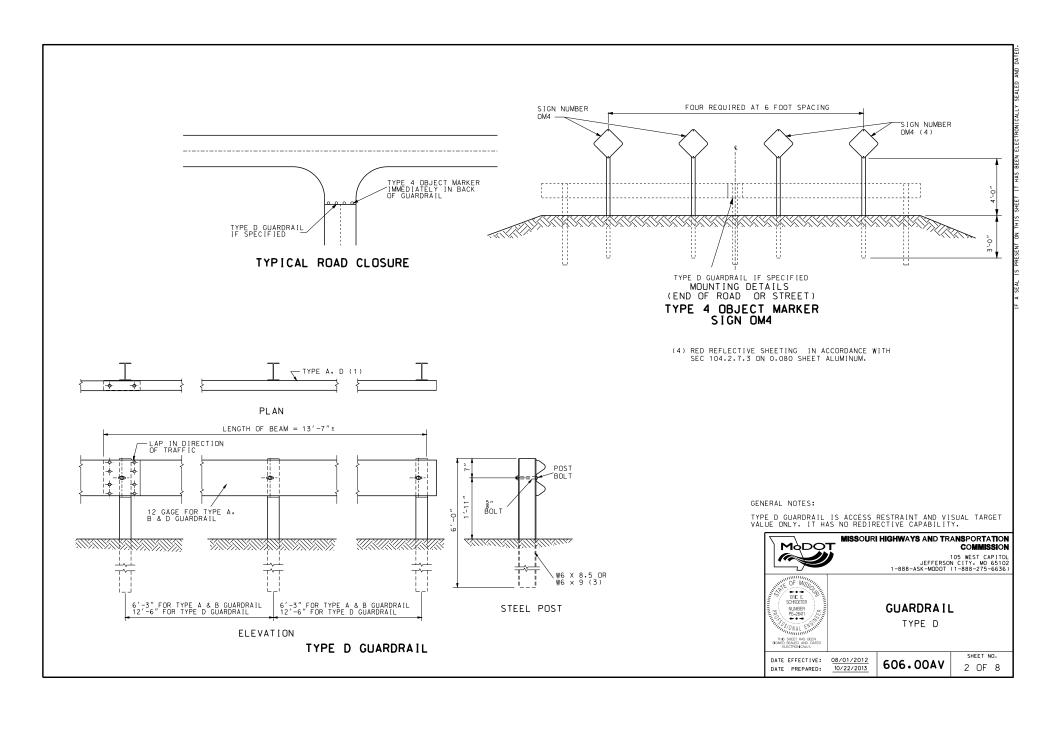
DATE EFFECTIVE: 06/01/2013 DATE PREPARED:

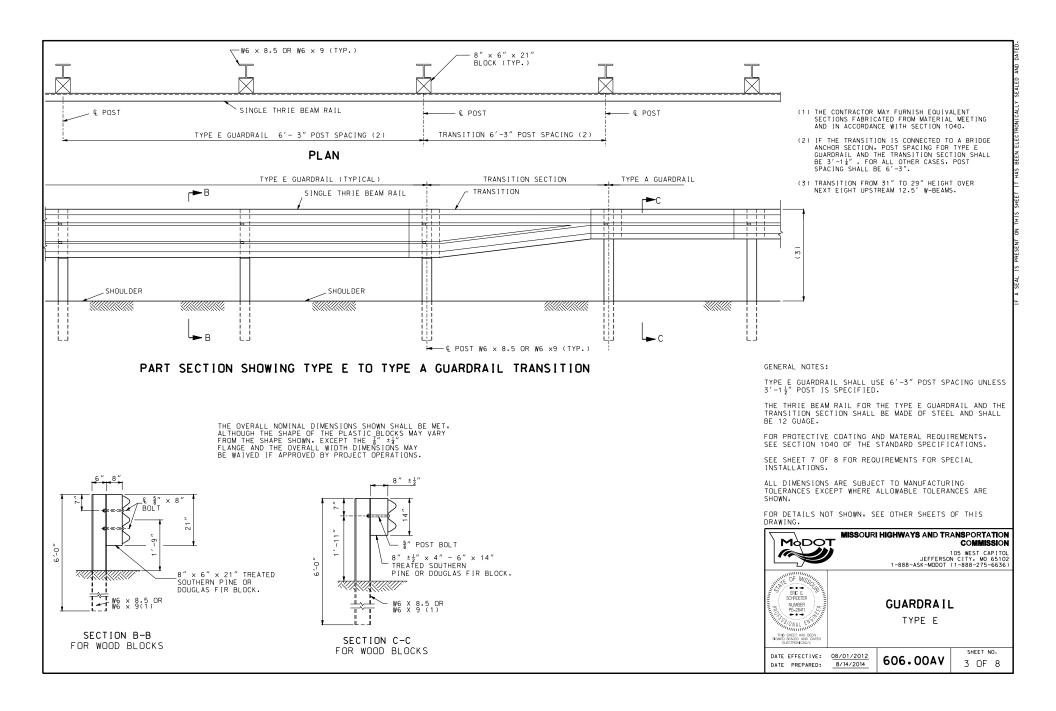
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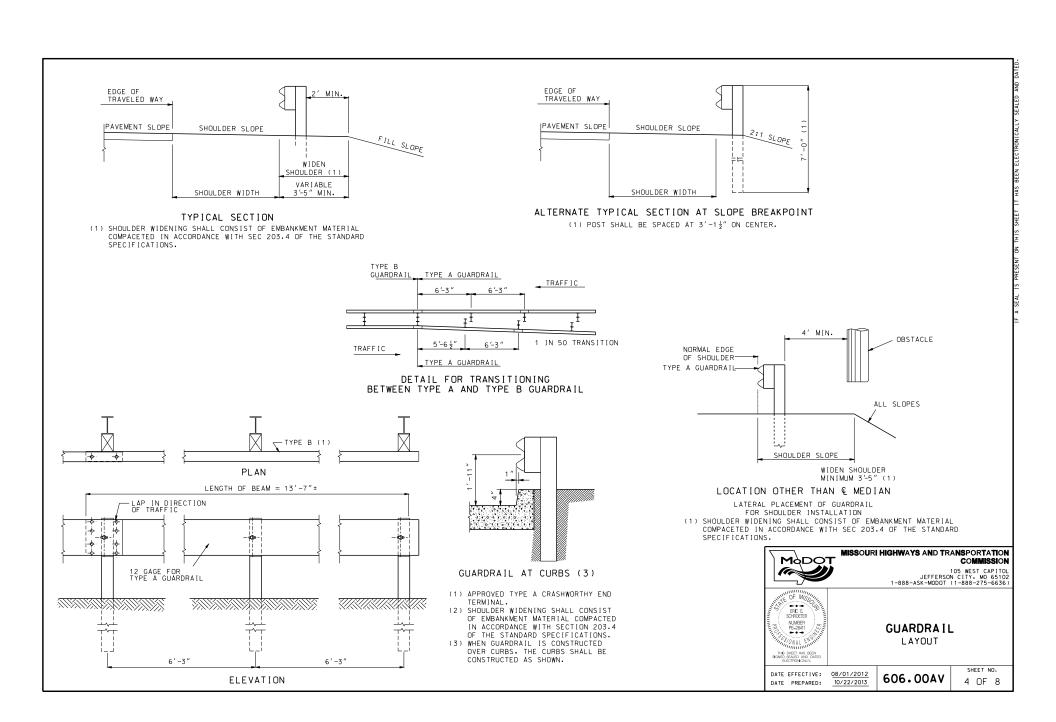
SHEET NO. 3 OF 4

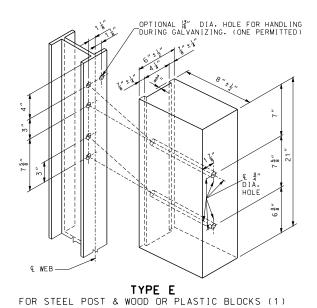


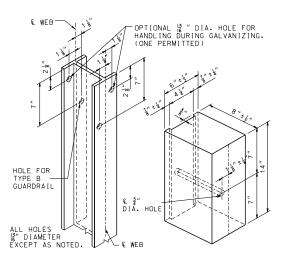


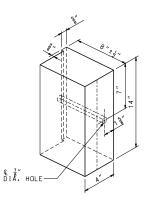








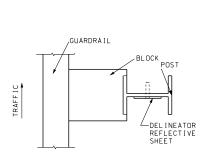


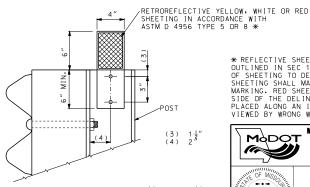


TYPE A AND TYPE B
FOR STEEL POST AND WOOD OR PLASTIC BLOCKS (1)

ALTERNATE DESIGN FOR WOOD BLOCK

(1) THE OVERALL NOMINAL DIMENSIONS SHOWN SHALL BE MET, ALTHOUGH THE SHAPE OF THE PLASTIC BLOCKS MAY VARY FROM THE SHAPE SHOWN, EXCEPT THE ## ±4" FLANGE AND THE OVERALL WIDTH DIMENSIONS MAY BE WAIVED IF APPROVED BY PROJECT OPERATIONS.





DELINEATORS SHALL BE AFFIXED WITH $1\frac{1}{2}''$ LONG X $\frac{1}{4}''$ DIAMETER BOLTS FOR STEEL POSTS OR $2^{\frac{1}{2}}''$ (MIN.) LONG DIAMETER BOLITS FOR STEEL FUSITS OR 2 (MIN.) LONG X % DIAMETER SCREWS FOR WOOD POSTS. THE DIAMETER OF THE BOLT'S OR SCREW'S HEAD SHALL BE TWICE THE DIAMETER OF THE HOLE, WITH A MINIMUM OF ½". WASHERS SHALL BE USED WITH THE BOLTS AND SHALL HAVE ½" DIAMETER HOLES.

DELINEATORS ON NEW GUARDRAIL

* REFLECTIVE SHEETING SHALL FOLLOW GUIDELINES OUTLINED IN SEC 1042.2.7 FOR CORRECT APPLICATION OUTLINED IN SEC 1042.2./ FOR CURRECT APPLICATION
OF SHEETING TO DELINEATOR BODY. THE COLOR OF THE
SHEETING SHALL MATCH THE CLOSEST ADJACENT PAVEMENT
MARKING. RED SHEETING SHALL BE APPLIED TO THE BACK
SIDE OF THE DELINEATOR WHEN THE DELINEATION IS
PLACED ALONG AN INTERCHANGE RAMP WHERE IT COULD BE VIEWED BY WRONG WAY TRAFFIC.



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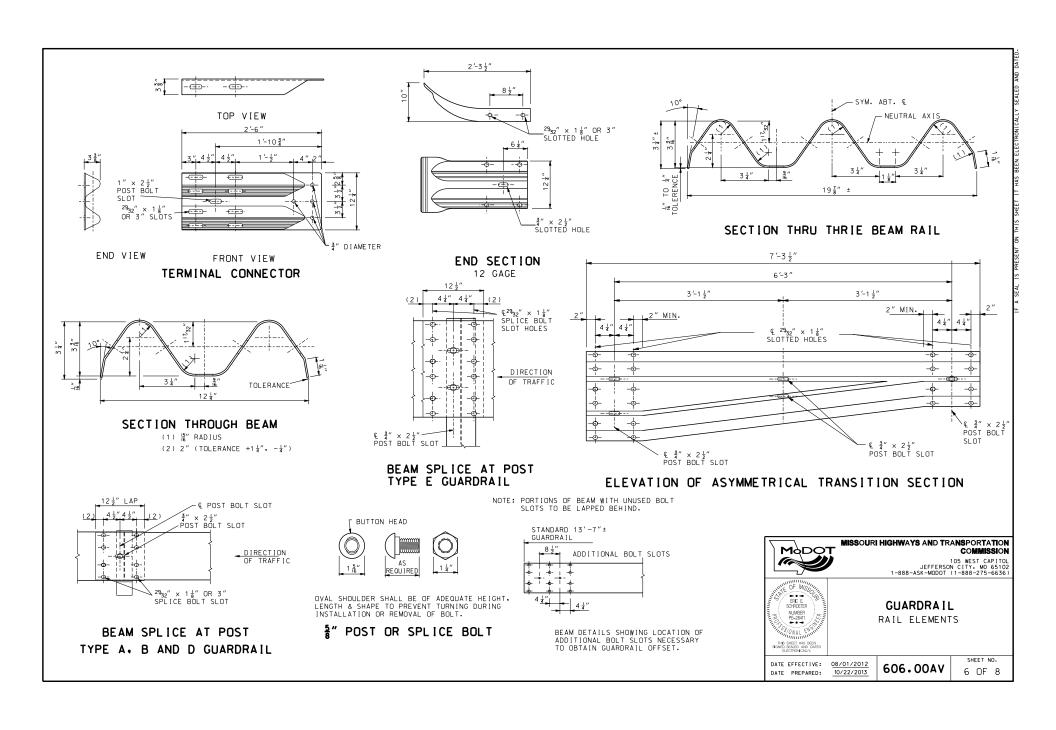
GUARDRAIL POST AND BLOCK

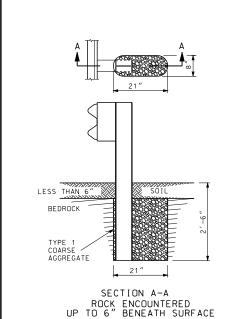
THIS SHEET HAS BEEN SIGNED, SEALED AND DATE ELECTRONICALLY.

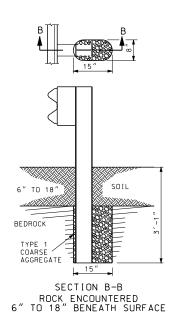
DATE EFFECTIVE: 08/01/2012 DATE PREPARED: 10/22/2013

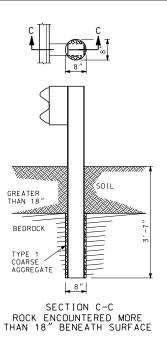
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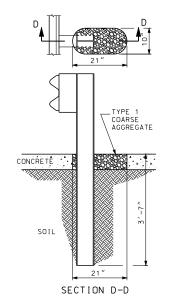
SHEET NO. 5 OF 8





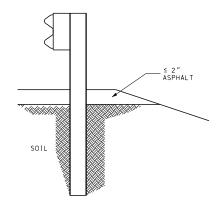






SETTING POST THROUGH CONCRETE

SETTING POST IN SOLID ROCK



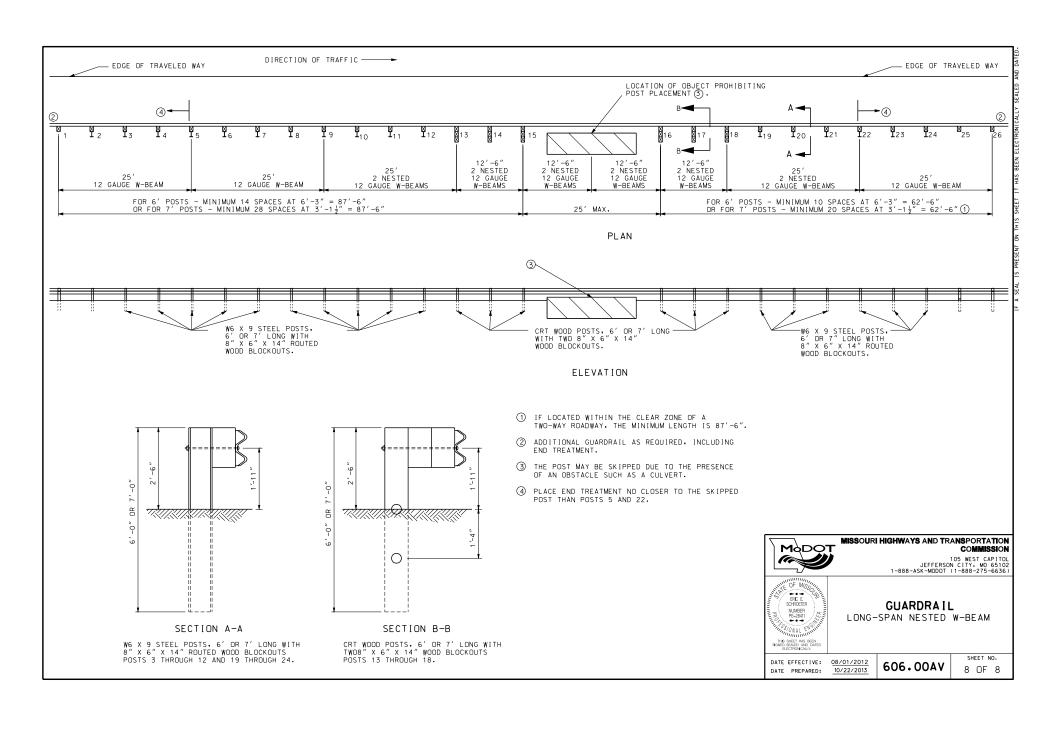
SETTING POST THROUGH ASPHALT

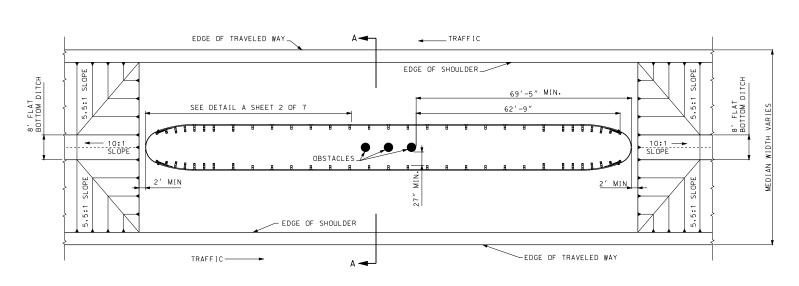
GENERAL NOTES:

HOLES IN SOLID ROCK SHALL PROVIDE A DIAMETER OF NOT LESS THAN 4 INCHES GREATER THAN THE MAXIMUM TRANSVERSE DIMENSION OF THE POST SECTION.

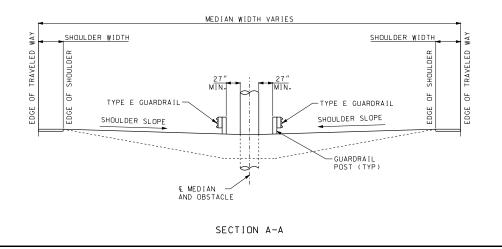
POST MAY BE SHORTER WHERE PLACED IN 2 FEET OF SOLID ROCK. STEEL POSTS MAY BE FLAME OR SAW CUT. REPAIR OF CUT SHALL BE IN ACCORDANCE WITH SECTION 712 OF THE STANDARD SPECIFICATIONS.







PIER AT & OF MEDIAN PLAN VIEW



GENERAL NOTES:

WOOD POSTS AND WOOD BLOCKS MAY BE USED ON TYPE E GUARDRAIL.

THE BULLNOSE GUARDRAIL PAY ITEM INCLUDES THE STRUCTURE BETWEEN POST 10 AND THE NOSE. THE REMAINING GUARDRAIL WILL BE PAID FOR AS STANDARD GUARDRAIL ITEMS.

SUITABLE DRAINAGE MUST BE PROVIDED WHEN MEDIAN GRADING IMPEDES NORMAL FLOW.

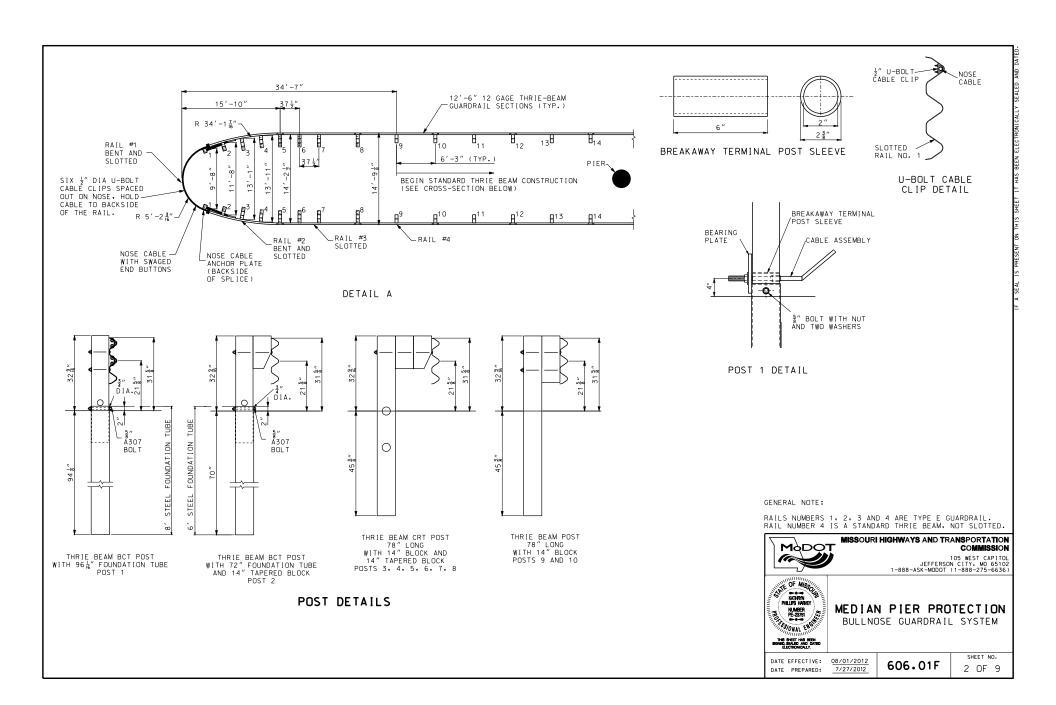


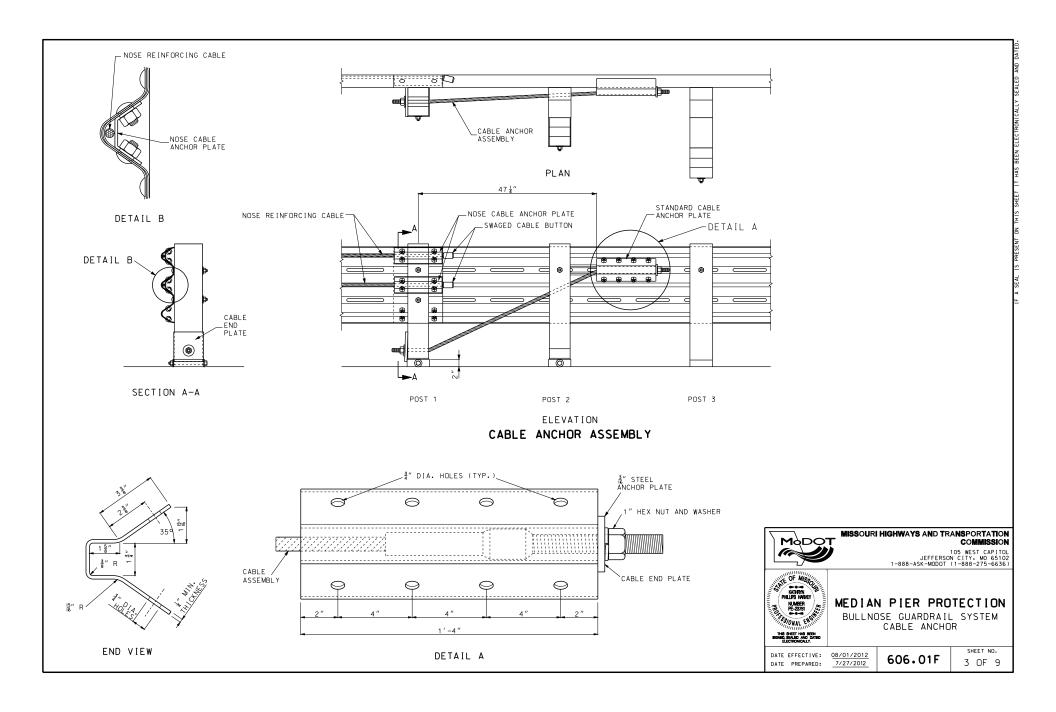
THE SHEET HAS BEEN SIGNED, SEALED AND DATED FLECTRONICALLY DATE EFFECTIVE: 08/01/2012

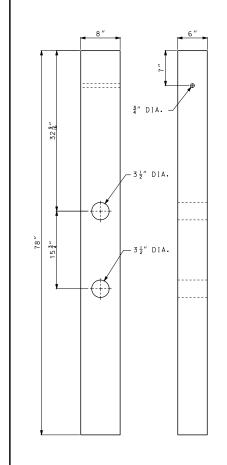
DATE PREPARED: 7/27/2012

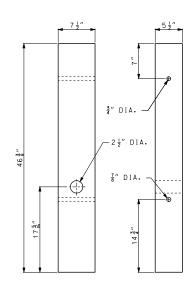
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SHEET NO. 1 OF 9

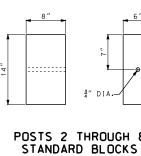




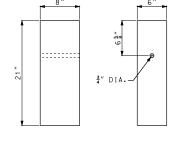




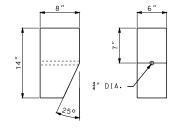
THRIE BEAM ANCHOR POSTS



POSTS 2 THROUGH 8



BLOCKS FOR POSTS 9 AND 10 STANDARD BLOCKS



TAPERED BLOCK

THRIE BEAM CRT POSTS





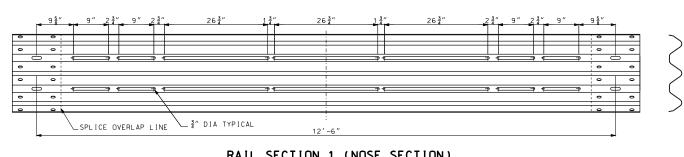
MEDIAN PIER PROTECTION

BULLNOSE GUARDRAIL SYSTEM POST AND BLOCKS

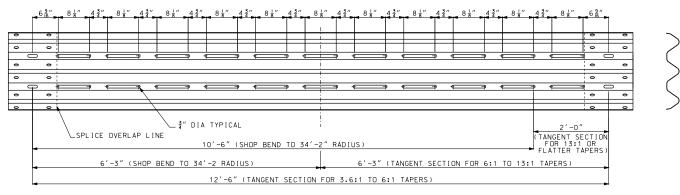
DATE EFFECTIVE: 08/01/2012 DATE PREPARED:

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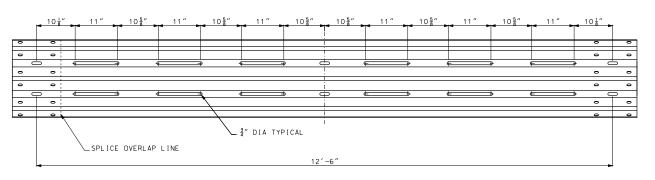
SHEET NO. 4 OF 9



RAIL SECTION 1 (NOSE SECTION)



RAIL SECTION 2



RAIL SECTION 3



MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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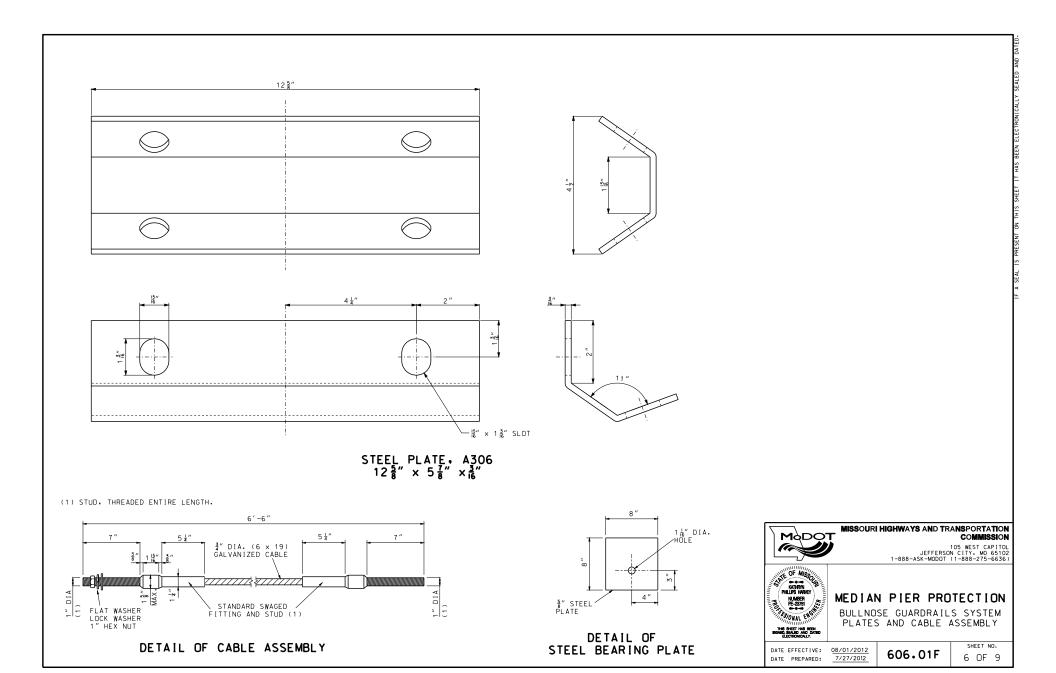
MEDIAN PIER PROTECTION

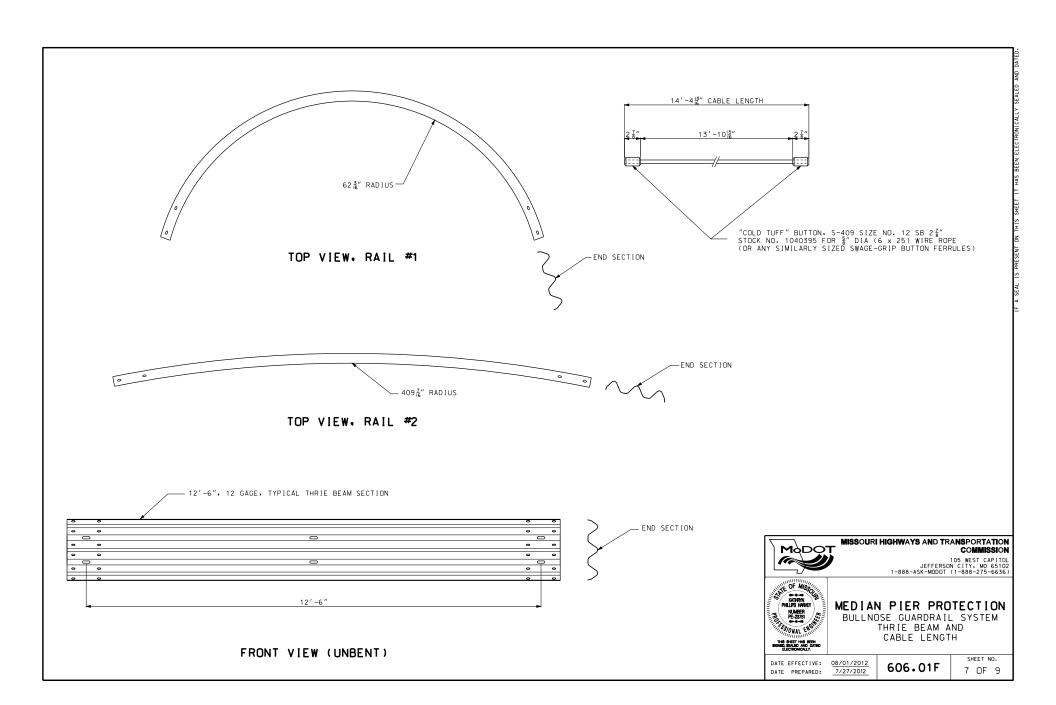
BULLNOSE GUARDRAIL SYSTEM RAIL SECTION 1, 2 AND 3

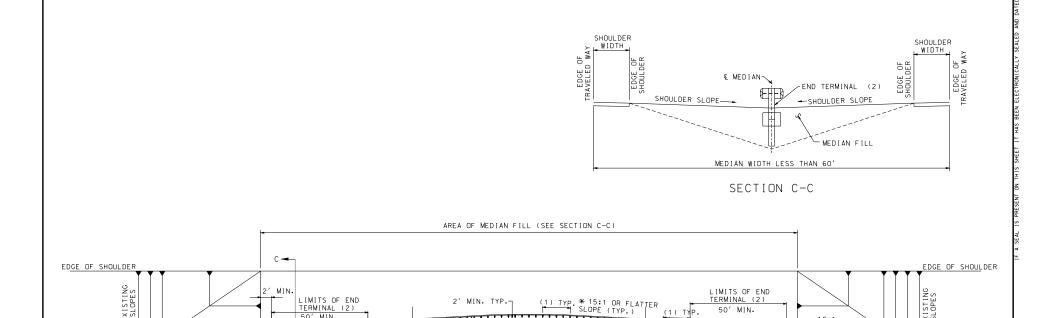
DATE EFFECTIVE: 08/01/2012 DATE PREPARED: 7/27/2012

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SHEET NO. 5 OF 9







2' MIN. TYP.

LIMITS OF END TERMINAL (2)

TYPE E GUARDRAIL (TYP.)

50' MIN.

c 🚤

10:1

EX I SL

EX.

EDGE OF SHOULDER

(1) TYPE E GUARDRAIL 12'-6" IN LENGTH AND FACTORY FORMED TO THE REQUIRED RADIUS.

VARIES

(2) PAYMENT FOR THE END TERMINAL WILL BE CONSIDERED FULL COMPENSATION FOR ANY TRANSITION SECTIONS. BACKUP ASSEMBLIES. OR OTHER ITEMS NECESSARY FOR PROPER INSTALLATION AS REQUIRED BY THE MANUFACTURER.

MEDIAN OBSTACLE

VARY SLOPE NO STEEPER THAN 15:1 TO UTILIZE A FULL 12.5' LENGTH OF GUARDRAIL WHEN ATTACHING TO THE CRASHWORTHY END TERMINAL.

GENERAL NOTES:

10:1-

TERMINAL (2)

50' MIN.

TYPE B CRASHWORTHY END TERMINAL SHALL BE LATEST VERSION AND SHALL BE INSTALLED ACCORDING TO MANUFACTURER'S RECOMENDATIONS.



EDGE OF SHOULDER



TYPE E MEDIAN PIER PROTECTION

EXISTING SLOPES

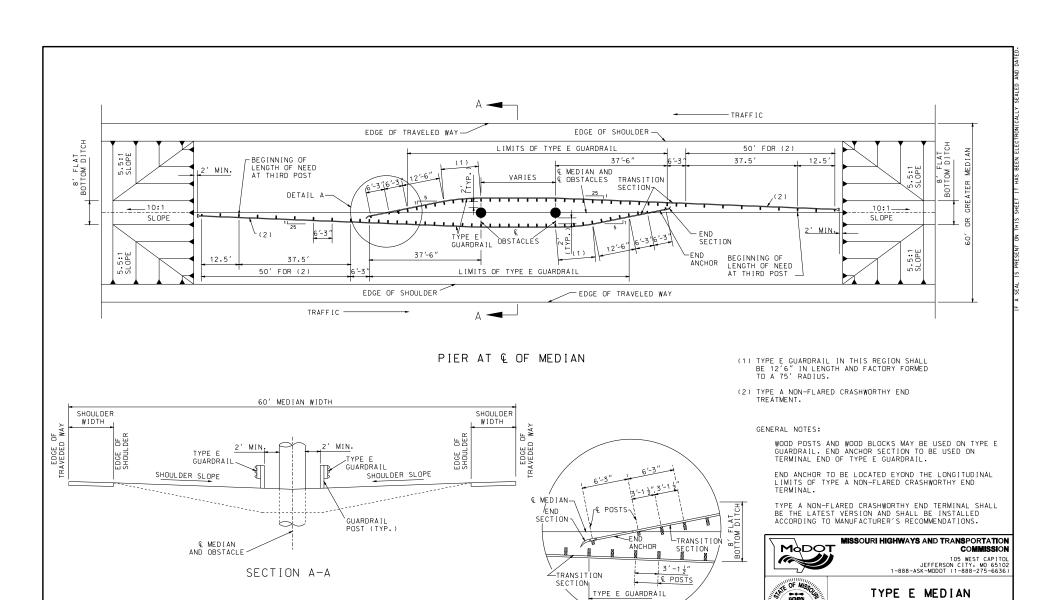
MEDIAN LESS THAN 60'

DATE EFFECTIVE: 08/01/2012 DATE PREPARED: 7/27/2012

606.01F

8 OF 9

SHEET NO.



TYPE E GUARDRAIL

DETAIL A

KATHRYN PHILLIPS HARVEY

NUMBER PE-23751 NUMBER PE-23751 S

THIS SHEET HAS BEEN SIGNED, SEALED AND DATED FI POTRONICALLY

DATE PREPARED:

DATE EFFECTIVE: 08/01/2012

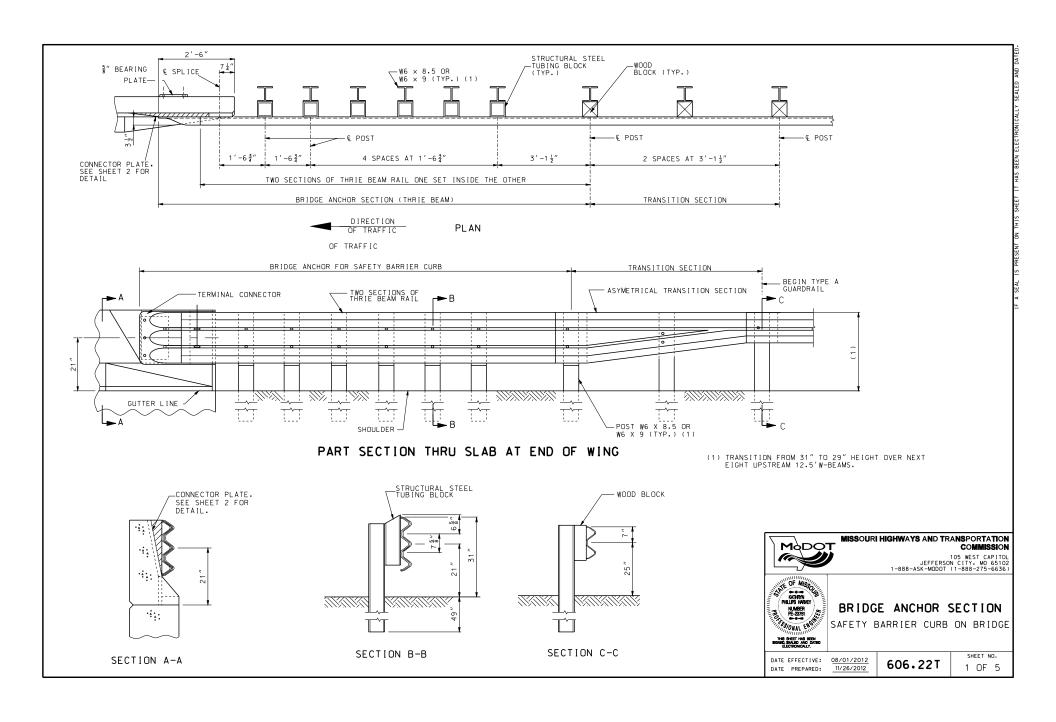
TYPE E MEDIAN PIER PROTECTION

60' MEDIAN OR GREATER

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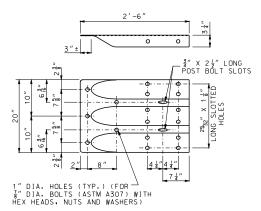
SHEET NO.

9 OF 9

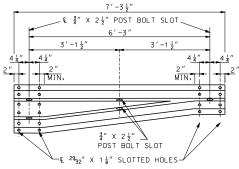


THRIE BEAM RAIL SPLICE AT POST

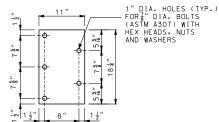
(1) THE CONTRACTOR MAY, AT HIS OPTION, FURNISH EQUIVALENT SECTIONS FABRICATED FROM MATERIAL MEETING AND IN ACCORDANCE WITH THE REQUIREMENTS OF ASTM A769 GRADE 36 OR 40. THE SECTIONS SHALL BE GALYANIZED AFTER FABRICATION IN ACCORDANCE WITH REQUIREMENTS OF AASHTO M 111.



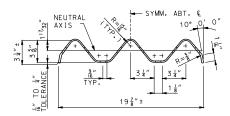
TERMINAL CONNECTOR



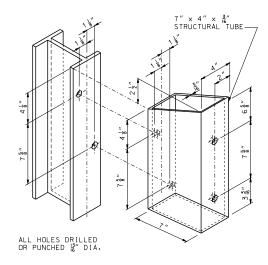
ASYMMETRICAL TRANSITION SECTION



BEARING PLATE



SECTION THROUGH THRIE BEAM RAIL



STRUCTURAL STEEL TUBING BLOCK DETAIL

GENERAL NOTES:

DESIGN BASED ON NCHRP REPORT 350 TEST LEVEL 3.

THE THRIE BEAM RAIL. TERMINAL CONNECTOR AND THE TRANSITION SECTION FOR THE BRIDGE ANCHOR SECTION SHALL BE MADE OF STEEL AND SHLL BE 12 GAGE.

FOR PROTECTIVE COATING AND MATERIAL REQUIREMENTS. SEE SECTION 1040 OF THE STANDARD SPECIFICATIONS.

RAIL POSTS SHALL BE SET PERPENDICULAR TO THE ROADWAY PROFILE GRADE AND VERTICALLY IN CROSS SECTION.

WASHERS SHALL BE USED AT ALL POST BOLTS.

STRUCTURAL TUBING BLOCK SHALL BE FABRICATED FROM ASTM A500 BRADE B STEEL AND GALVANIZED.

USE $\frac{5}{8}''$ BUTTON-HEAD OVAL SHOULDER BOLTS WITH HEX NUTS AT ALL SLOTS (THICKNESS OF HEX NUTS = $\frac{3}{8}''$

THE BEARING PLATE SHALL BE FABRICATED FROM GRADE A36 STEEL AND GALVANIZED.

ALL LAP SPLICES, INCLUDING END SHOES, SHALL BE MADE IN THE DIRECTION OF TRAFFIC.

SEE STANDARD PLAN 606.00 FOR DETAILS NOT SHOWN.

THE COST OF FURNISHING, FABRICATING AND INSTALLING TRANSITION SECTION, COPLETE IN PLACE, WILL BE PAID FOR AT THE CONTRACT UNIT PRICE PER EACH.

THE COST OF FURNISHING FABRICATING AND INSTALLING BRIDGE ANCHOR SECTION (SAFETY BARRIER CURB), COMPLETE IN PLACE, WILL BE PAID FOR AT THE CONTRACT UNIT PRICE PER EACH.

LOCK SHALL BE OF THE SAME TYPE THROUGHOUT THE PROJECT LIMITS.

FOR DETAILS OF BLOCKS ON STEEL POSTS. SEE STANDARD PLAN 606.00.





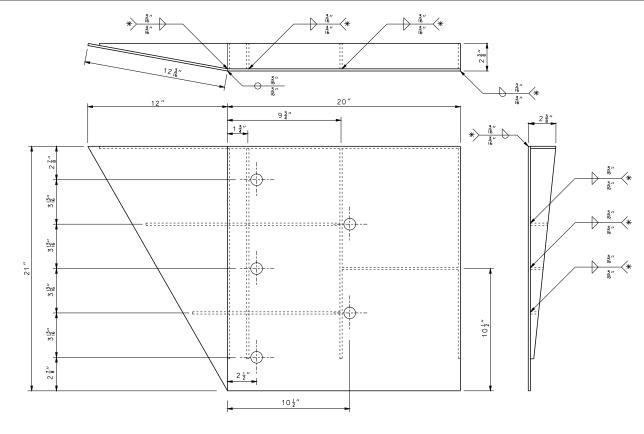
BRIDGE ANCHOR SECTION

SAFETY BARRIER CURB ON BRIDGE

DATE EFFECTIVE: 08/01/2007 DATE PREPARED:

606.22T

SHEET NO. 2 OF 5



WELDING INSTRUCTION

* ALL FILLET WELDS SHALL BE 1" LONG SPACED AT 2".

GENERAL NOTES:

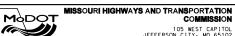
COVER PLATE PANELS ARE 4.3" THICK.

ALL STIFFENERS ARE 4" THICK.

CONNECTOR PLATE SHALL BE FABRICATED FROM ASTM GRADE A36 STEEL AND GALVANIZED.

FOR GALVANIZED REQUIREMENTS. SEE SECTION 1040 OF THE STANDARD SPECIFICATIONS.

ALL HOLE DIAMETERS SHALL BE 1".



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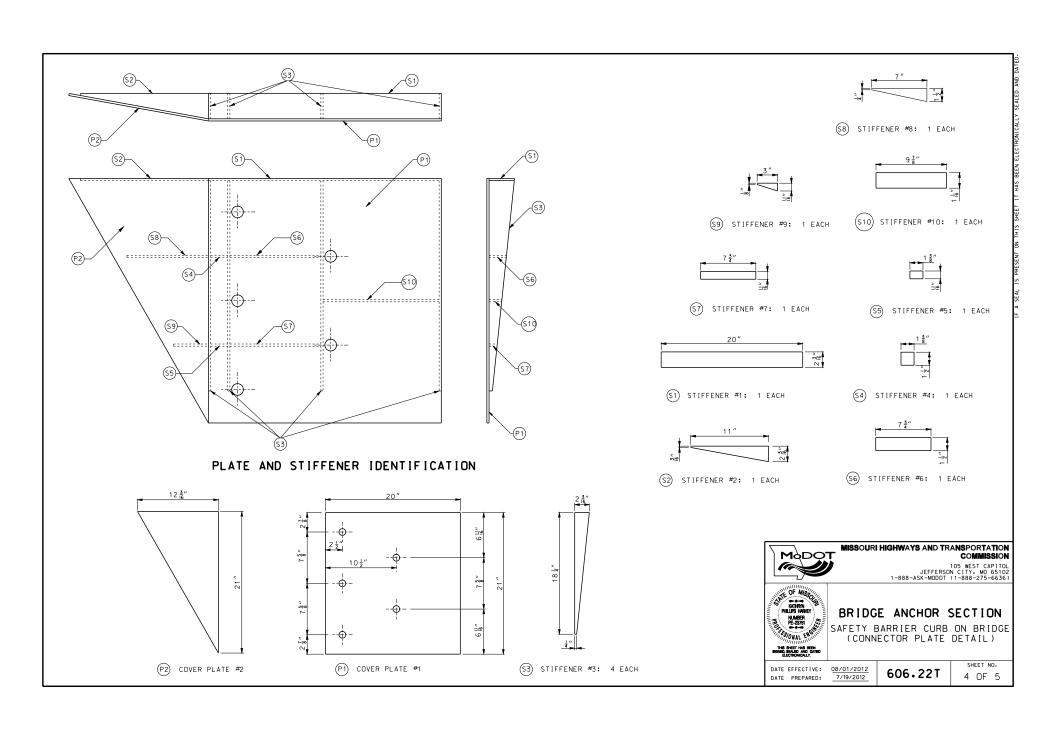


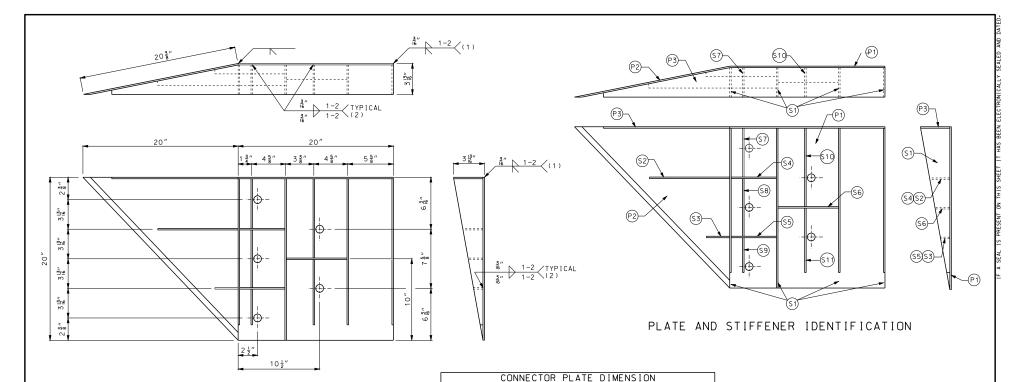
BRIDGE ANCHOR SECTION SAFETY BARRIER CURB ON BRIDGE (CONNECTOR PLATE DETAIL)

DATE EFFECTIVE: 08/01/2012 DATE PREPARED: 7/19/2012

606.22T

SHEET NO. 3 OF 5





WELDING INSTRUCTION

- (1) STIFFENERS LOCATED AT THE OUTSIDE EDGES OF THE COVER PLATES SHALL BE WELDED AS FOLLOWS:
 SINGLE BEVEL GROOVE WELD ON EXTERNAL SIDES AND %"
 FILLET WELD BY 1" LONG SPACED AT 2" ON INTERNAL SIDES.
- (2) STEFFENERS LOCATED ON THE INSIDE OF THE COVER PLATE SHALL BE WELDED AS FOLLOWS:

	(PER ASSEMBLY)								
PLATE	QUANTITY	SHAPE	SIZE (A × B × C × D)	THICKNESS					
P1	1	B_A	20" × 20"	3 " 16					
P2	1	B₽€	20" x 20" x 28흖"	3 " 16					
Р3	1	B _C D	39" x 3 \{ " x 20" x 19 \{ \} "	3." 16					
S1	4	B C	$18\frac{7}{16}$ " × $3\frac{5}{8}$ " × $18\frac{3}{4}$ "	1 " 4					
S2	1	B O D	$10\frac{1}{4}$ " × $2\frac{7}{16}$ " × $10\frac{3}{8}$ " × $\frac{1}{2}$ "	<u> </u> "					
S3	1	B☐D	$3" \times 1\frac{1}{16}" \times 3\frac{1}{8}" \times \frac{1}{2}"$	1 ″					
S4	1	вЁ	$6\frac{1}{8}'' \times 2\frac{7}{16}''$	1/″					
S5	1	в∟	6 ½" × 1 ½"	1 " 4					
S6	1	в≞	7 \(\frac{3}{4}'' \times 1 \(\frac{3}{4}'' \)	<u>1</u> "					
S7	1	ABC	$2\frac{9}{16}$ " × 6" × $3\frac{5}{8}$ " × $5\frac{7}{8}$ "	<u>1</u> ″					
S8	1	AЫC	1^{5}_{32} " × $7\frac{1}{2}$ " × $2\frac{1}{2}$ " × $7\frac{3}{8}$ "	1 ″					
S9	1	C B	6 16" × 6 18" × 1 3 ₃₂ "	1 "					
S10	1	ď,	$1\frac{7}{8}$ " × $9\frac{7}{8}$ " × $3\frac{5}{8}$ " × $9\frac{11}{16}$ "	1 " 4					
S11	1	C B	$8\frac{1}{2}$ " \times $8\frac{3}{4}$ " \times $1\frac{13}{16}$ "	1 "					

GENERAL NOTES:

COVER PLATE PANELS ARE &" THICK.

ALL STIFFENERS ARE 4" THICK.

CONNECTOR PLATE SHALL BE FABRICATED FROM ASTM GRADE A36 STEEL AND GALVANIZED.

FOR GALVANIZED REQUIREMENTS. SEE SECTION 1040 OF THE STANDARD SPECIFICATIONS.

ALL HOLE DIAMETERS SHALL BE 1".



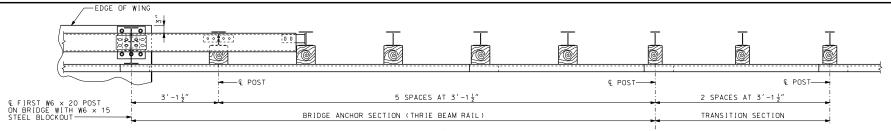


BRIDGE ANCHOR SECTION SAFETY BARRIER CURB ON BRIDGE

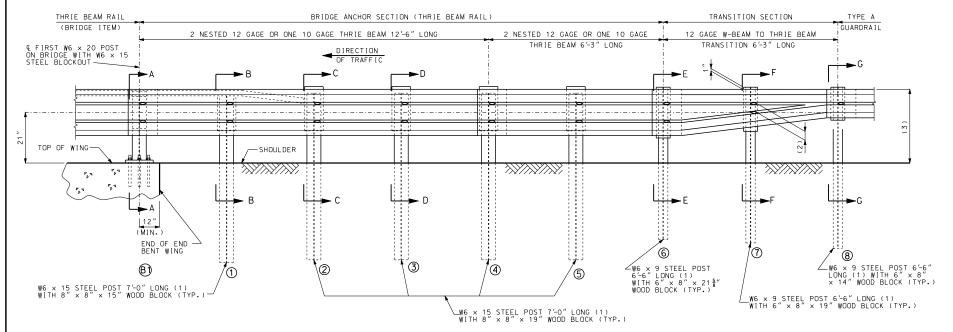
(CONNECTOR PLATE DETAIL) SINGLE SLOPE BARRIERS

DATE EFFECTIVE: 08/01/2012 DATE PREPARED: 7/19/2012

606.22T



PLAN



PART SECTION THROUGH SLAB AT END OF WING

NOTES:

FOR GENERAL NOTES, SEE SHEET 2 OF 5. FOR POST DETAILS AND SECTION VIEWS, SEE SHEET 2 AND 3 OF 5.

- (1) AT CONTRACTOR'S OPTION, EQUIVALENT SECTIONS MAY BE FABRICATED FROM MATERIAL MEETING AND IN ACCORDANCE WITH THE REQUIREMENTS OF ASTM A769 GRADE 36 OR 40. THE SECTIONS SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH THE REQUIREMENTS OF ASSHTO 111.
- (2) VERIFY BY RAIL TRANSITION PRODUCER.
- (3) TRANSITION FROM 31" TO 29" HEIGHT OVER NEXT EIGHT UPSTREAM 12.5' W-BEAMS.



MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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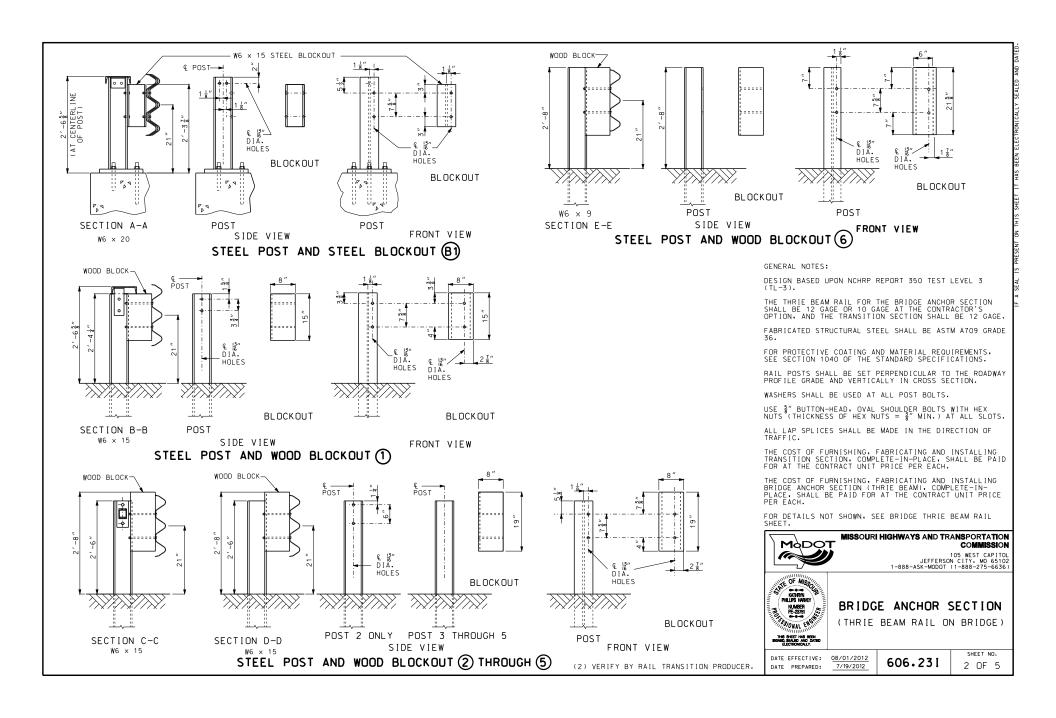


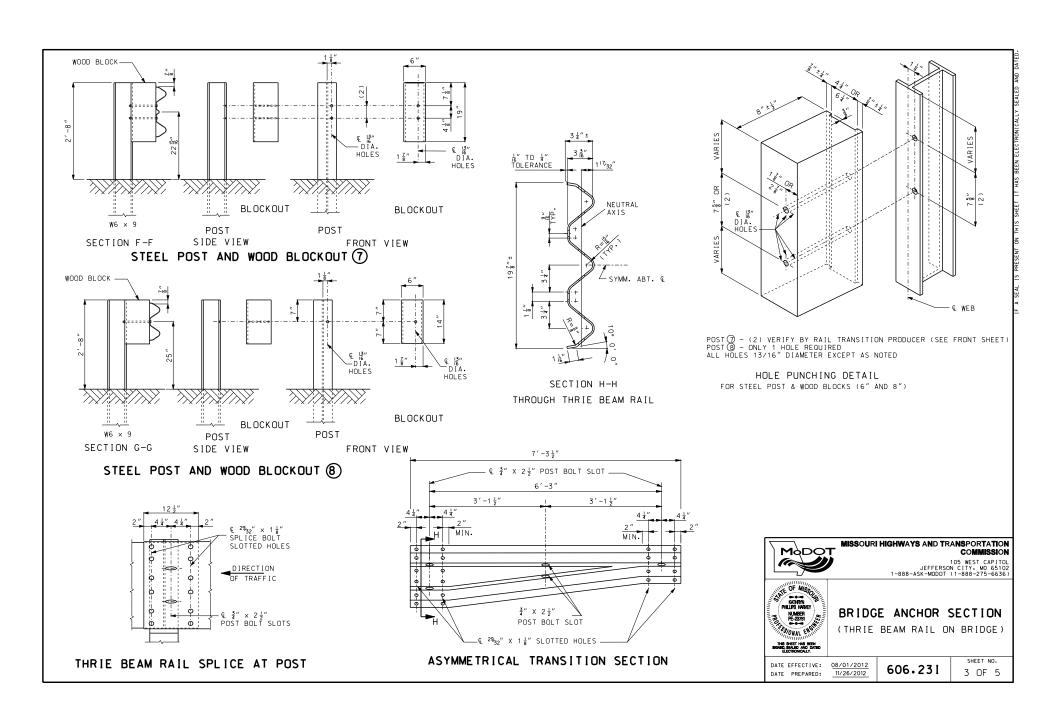
BRIDGE ANCHOR SECTION

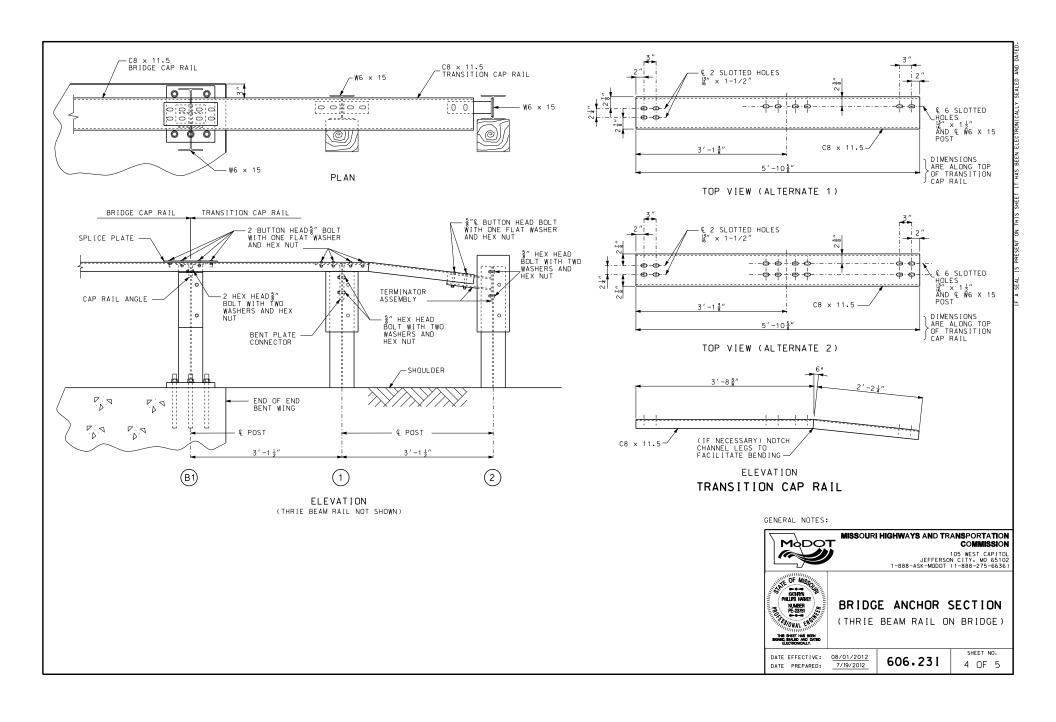
(THRIE BEAM RAIL ON BRIDGE)

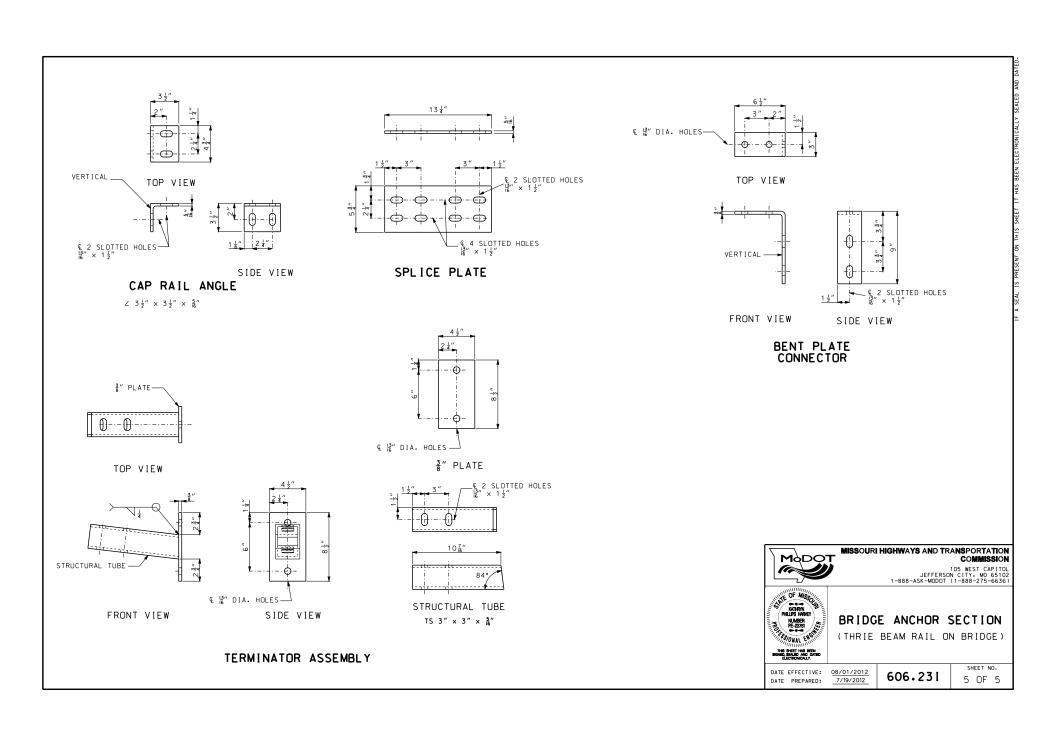
DATE EFFECTIVE: 08/01/2012 DATE PREPARED:

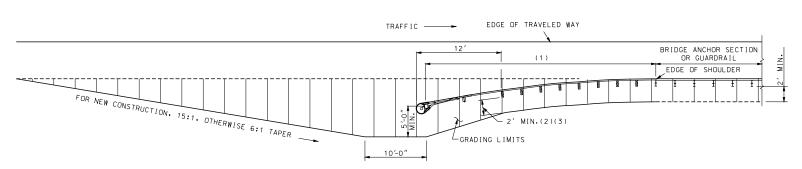
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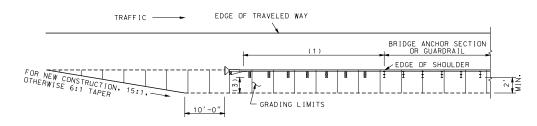




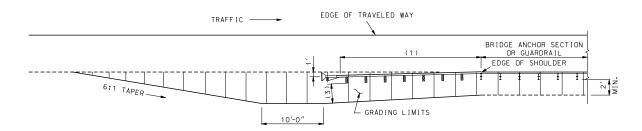




GRADING LIMITS FOR TYPE A FLARED CRASHWORTHY END TERMINAL



GRADING LIMITS FOR TYPE A NON-FLARED CRASHWORTHY END TERMINAL



GRADING LIMITS FOR TYPE A NON-FLARED OFFSET CRASHWORTHY END TERMINAL

- (1) APPROVED TYPE A CRASHWORTHY END TERMINAL.
- (2) THE SLOPE SHOULD BREAK BEHIND THIRD POST.

 (3) AS PER MANUFACTURER'S SPECIFICATIONS, 2'
 MINIMUM. NO DIRECT PAY.

GENERAL NOTES:

THE CONTRACTOR SHALL PROVIDE THE ENGINEER WITH APPROVED SHOP DRAWINGS OF THE APPROVED CRASH-WORTHY END TERMINAL.

END ANCHORS SHALL BE INSTALLED ON ENDS OF GUARDRAIL RUNS WHERE CRASHWORTHY END TERMINAL IS NOT REQUIRED.

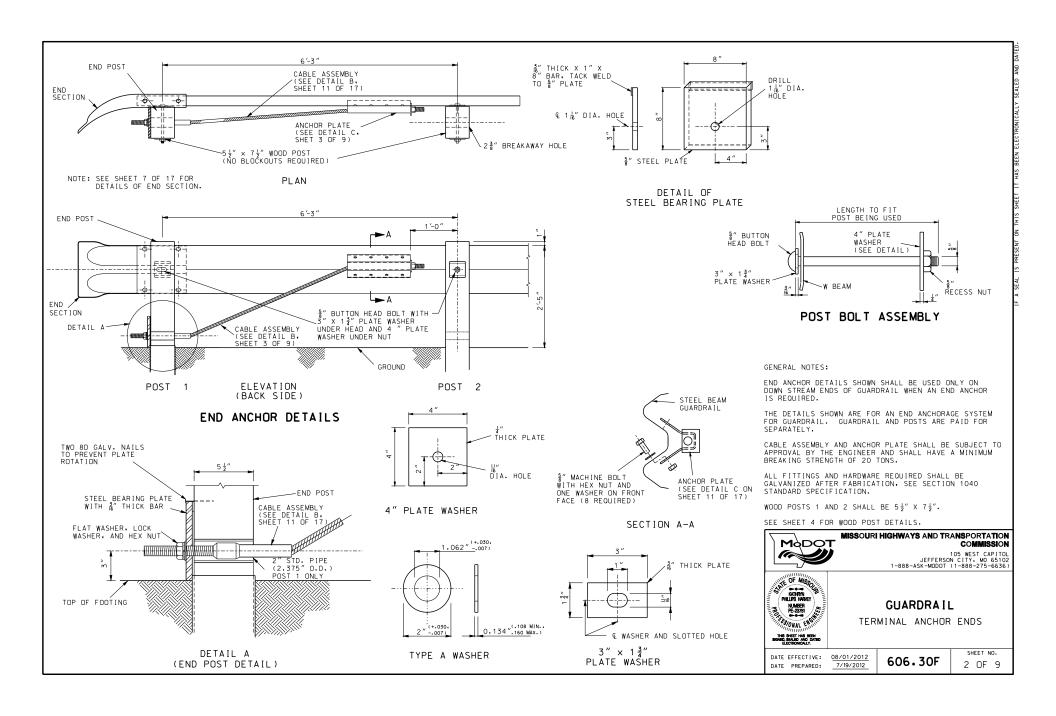


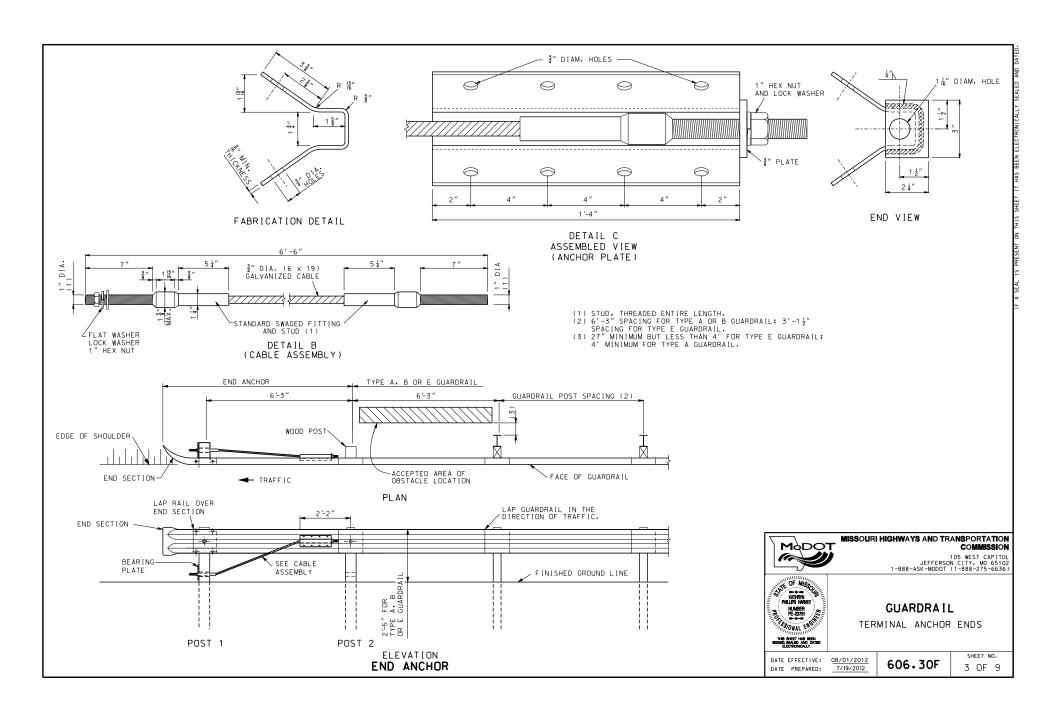
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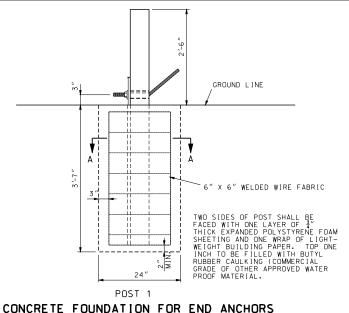


GUARDRAIL TERMINAL ENDS CRASHWORTHY

DATE EFFECTIVE: 08/01/2012 606.30F DATE PREPARED:



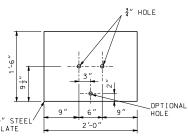


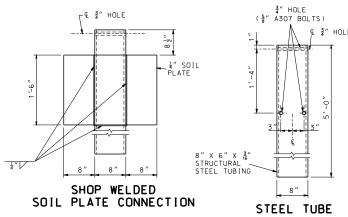


2" STANDARD PIPE

¾" POLYSTYRENE FOAM 6" X 6" WELDED WIRE FABRIC 5½" X 7½ END POST 24 INCH DIAMETER CONCRETE FOOTING

SECTION A-A EXPANDED POLYSTYRENE FOAM INSTALLATION DETAIL





FRONT VIEW SIDE VIEW WOOD BREAKAWAY POST SEE SECTION 1050

¾" HOLE

§" BOLT

2층" HOLE

GROUND LINE

3" HOLE (5" A307 BOLT)

STEEL TUBE

FOUNDATION

- -----

 $3'-8\frac{1}{2}"$

- (1) 5'-11 ½" FOR CONCRETE FOUNDATION ALTERNATE.
- (2) 3'-8½" FOR CONCRETE FOUNDATION ALTERNATE.

GENERAL NOTES:

(2)

1 '-3 ½"

THE CONTRACTOR HAS THE OPTION TO INSTALL WOOD POST 1 AND 2 IN STEEL TUBE OR CONCRETE FOUNDATION.

TRIMMING OF WOOD POST MAY BE NECESSARY FOR STEEL TUBE FOUNDATION.

STEEL TUBE FOUNDATIONS SHALL BE DRILLED AND BACK-FILLED WITH A SUITABLE MATERIAL WHEN THE SOIL PLATE IS BOLTED. AS SHOWN. TO THE STEEL TUBE. STEEL TUBE FOUNDATION MAY BE DRIVEN WHEN THE SOIL PLATE IS WELDED, AS SHOWN, TO THE STEEL TUBE.



MODOT

(m)

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

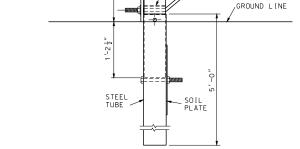
105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)

GUARDRAIL TERMINAL ANCHOR ENDS

DATE EFFECTIVE: 08/01/2012 DATE PREPARED: 7/19/2012

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SHEET NO. 4 OF 9

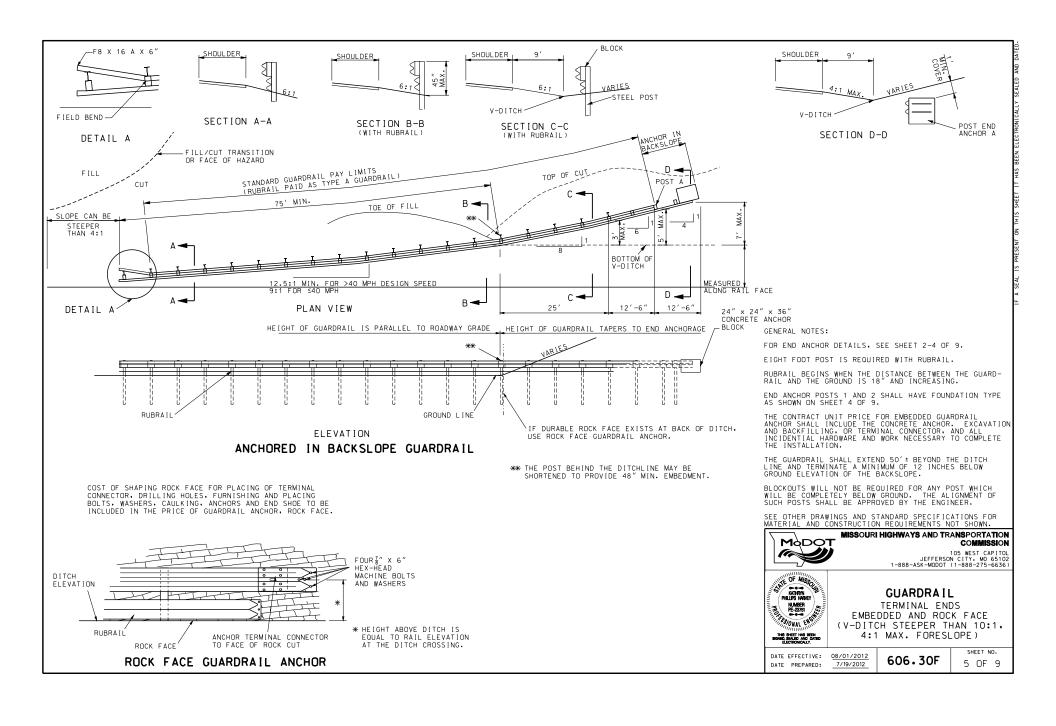


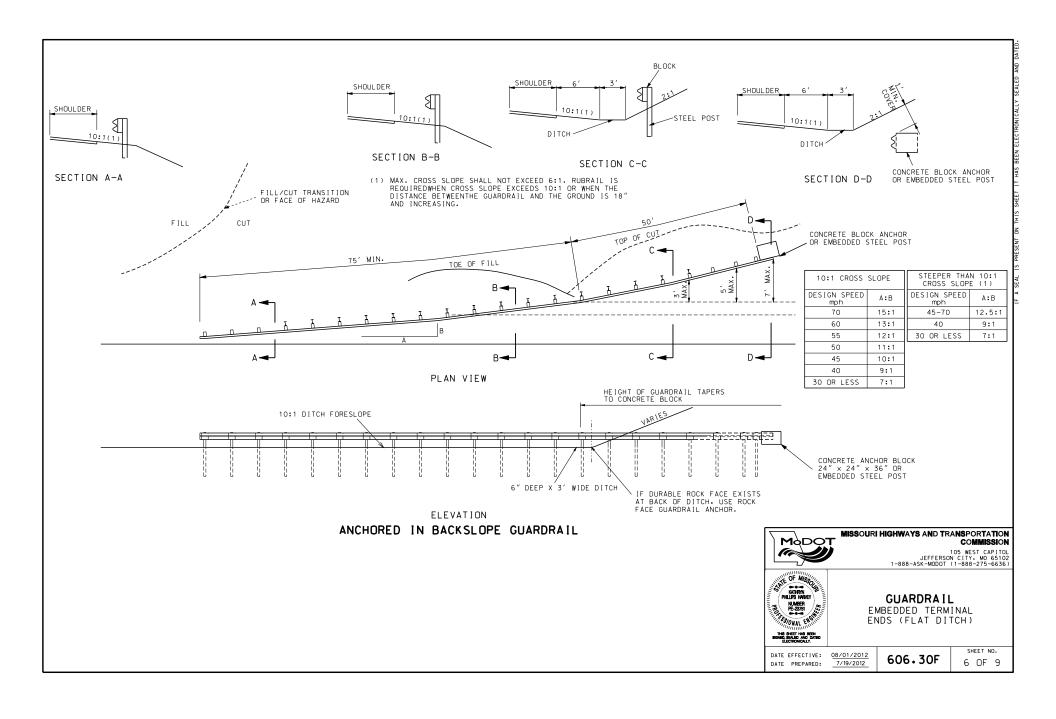
POST 1 STEEL TUBE FOUNDATION FOR END ANCHORS

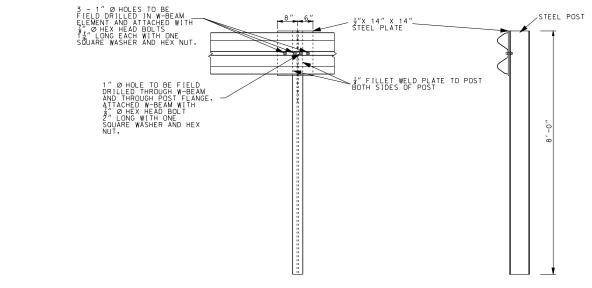
BOLTS AND NUTS SHALL BE GALVANIZED IN ACCORDANCE WITH THE REQUIREMENTS OF AASHTO M232. OR THEY MAY BE MECHANICALLY GALVANIZED IN ACCORDANCE WITH AASHTO M232 CLASS C.

OPTIONAL ¼" STEEL PLATE SOIL PLATE

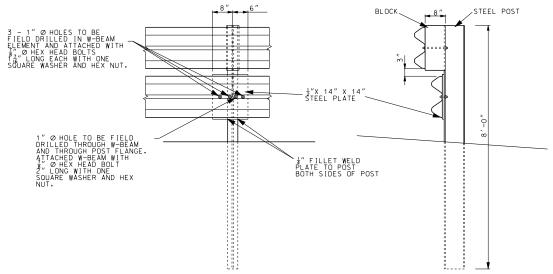
€ ¾" HOLE







EMBEDDED STEEL POST







MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

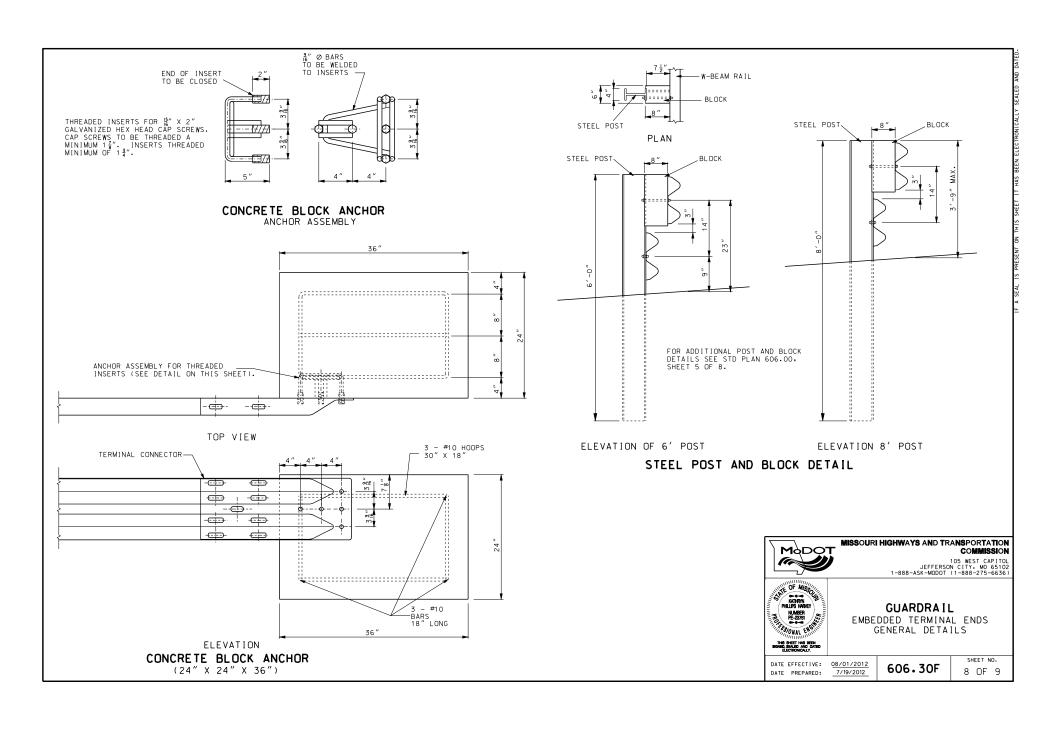
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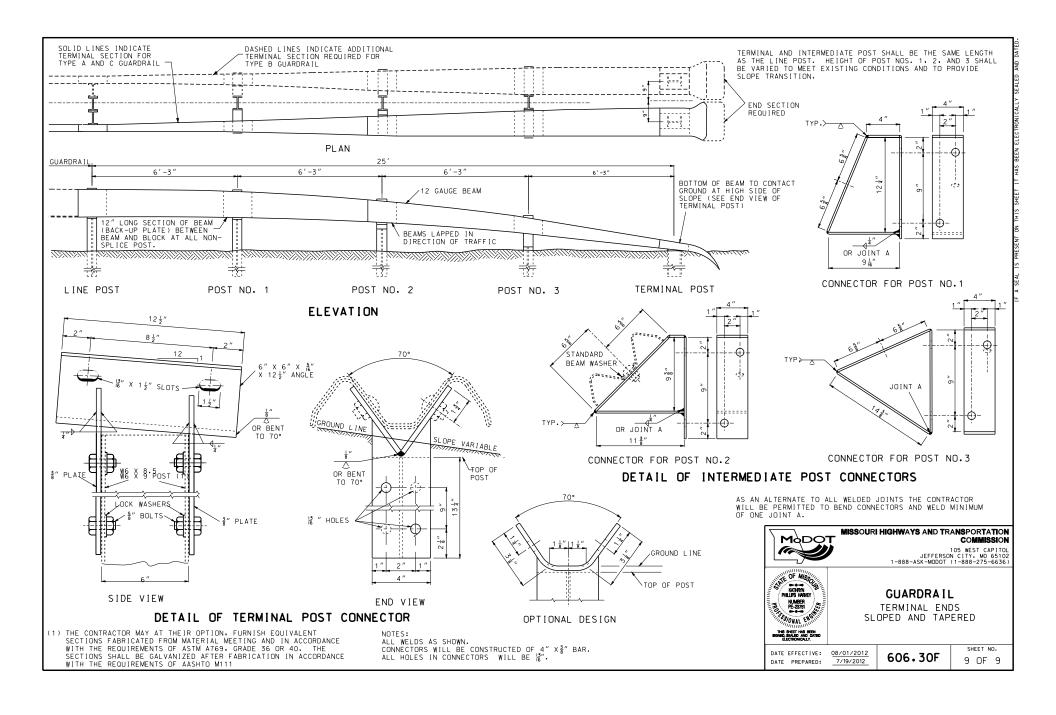


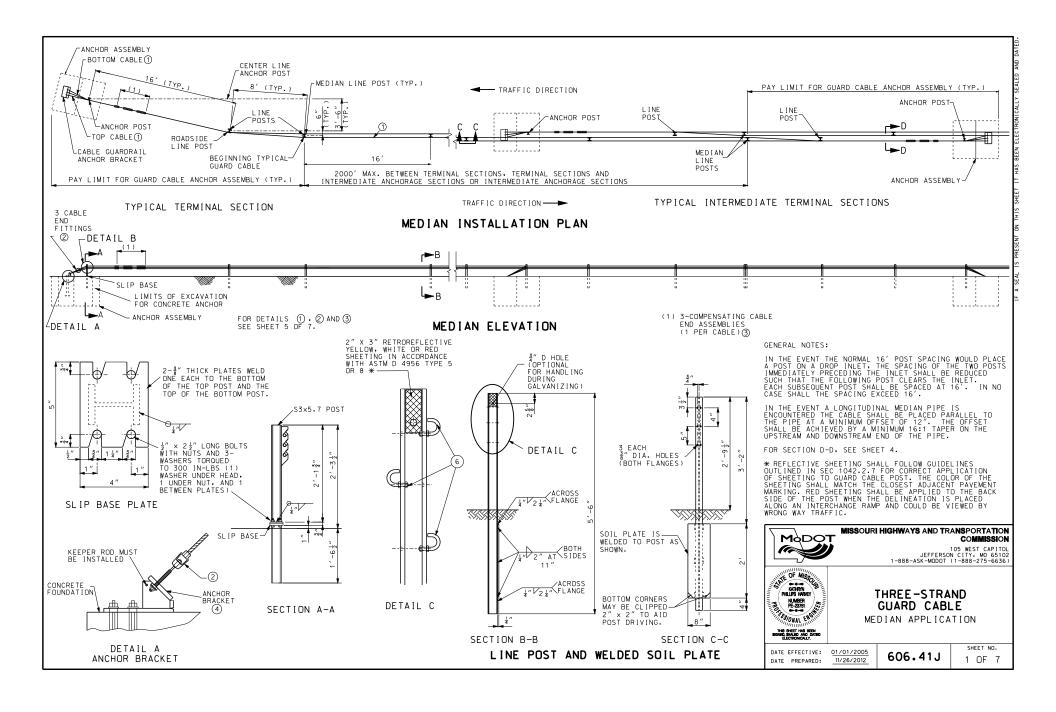
GUARDRAIL EMBEDDED ANCHOR TERMINAL ENDS (STEEL POST OPTION)

DATE EFFECTIVE: 08/01/2012 DATE PREPARED: 7/19/2012

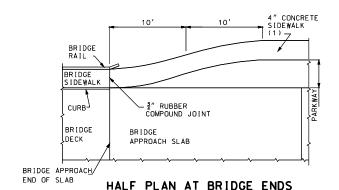
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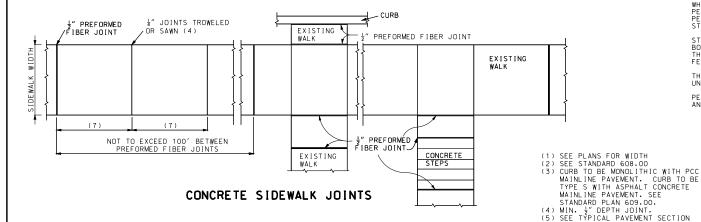




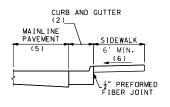


TYPICAL SIDEWALK WITH PARKWAY 2' OR MORE





MAINLINE PAVEMENT WIDTH (CURB) (3)(5) 12 __SIDEWALK 6' MIN. (6)_ SEE -ROADWAY SECTION ∮" PREFORMED FIBER JOINT



CURB CURB AND GUTTER

TYPICAL SIDEWALK WITH NO PARKWAY

GENERAL NOTES:

ALL AREAS OF THE PEDESTRIAN ACCESS ROUTE MUST BE COMPLIANT WITH THE AMERICANS WITH DISABLILITES ACT - GUIDELINES FOR ACCESSIBLE PUBLIC RIGHTS OF WAY. EXCEPTIONS MUST BE APPROVED BY THE ENGINEER. ALL OTHER AREAS OF NON-COMPLIANCE SHALL BE REMOVED AND CORRECTED AT THE CONTRACTOR'S EXPENSE.

THE SURFACES OF PEDESTRIAN ACCESS ROUTES AND ELEMENTS, AND SPACES REQUIRED TO CONNECT TO PEDESTRIAN ACCESS ROUTES, SHALL BE FIRM, STABLE, SLIP RESISTANT, AND SHALL NOT POND WATER.

WHERE SIDEWALKS ARE LESS THAN 5 FT., 5 FT. X 5 FT. PASSING SPACES EVERY 200 FT. SHALL BE PROVIDED AND ARE PERMITTED TO OVERLAP PEDESTRIAN ACCESS ROUTES.

THE CROSS SLOPE OF THE CONTINUOUS PEDESTRIAN ACCESS ROUTE THROUGH ENTRANCES, ALLEYS, AND SIDEROAD CONNECTIONS WITH STOP OR YIELD CONTROL SHALL BE 1.00% TO FACILITATE DRAINAGE (2.00% MAX.).

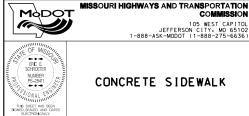
WHERE PEDESTRIAN ACCESS ROUTES ARE CONTAINED WITHIN PEDESTRIAN STREET CROSSINGS WITHOUT YIELD OR STOP CONTROL. THE CROSS SLOPE OF THE PEDESTRIAN ACCESS ROUTE SHALL BE

WHERE PEDESTRIAN ACCESS ROUTES ARE CONTAINED WITHIN MIDBLOCK PEDESTRIAN STREET CROSSINGS, THE CROSS SLOPE OF THE PEDESTRIAN ACCESS, ROUTE SHALL BE PERMITTED TO EQUAL THE STREET OR HIGHWAY GRADE.

STORMWATER INLETS, SIGNS, POSTS, MANHOLE COVERS, PULL BOXES AND OTHER ACCESS LIDS SHOULD BE AVOIDED WITHIN THE SIDEWALK. IF SUCH A LOCATION IS NECESSARY, THE FEATURE MUST MEET ADA STANDARDS.

THE RUNNING GRADE OF A SIDEWALK SHALL NOT EXCEED 5.0% UNLESS IT IS MATCHING THE GRADE OF THE ADJACENT ROADWAY.

PEDESTRIAN ACCESS ROUTE SHALL CONTINUE ACROSS RESIDENTIAL AND COMMERCIAL ENTRANCES, ALLEYS, AND SIDEROAD CONNECTIONS.



04/01/2015 DATE EFFECTIVE: DATE PREPARED: 2/20/2015

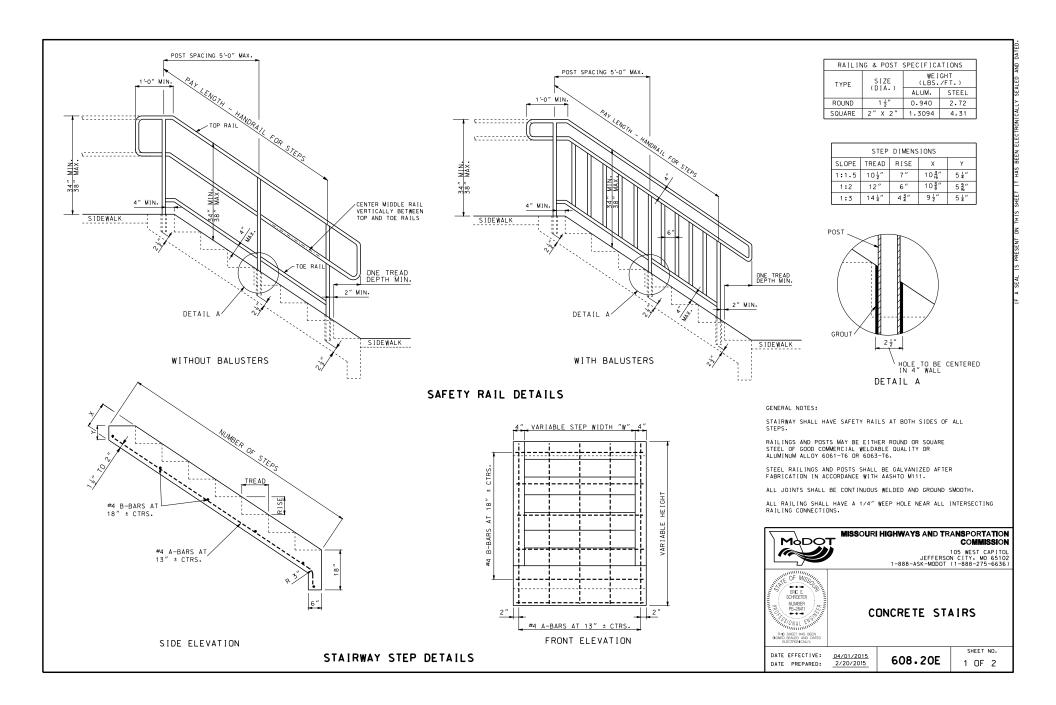
608.10P

SHEET NO. 1 OF 1

COMMISSION

(7) SPACING EQUAL TO WIDTH OF WALK

(6) SLOPE 1.0% (2.0% MAX.)



QUANTITIES FOR CONCRETE STEPS CONCRETE C.Y. STEEL LB.														
10½" TREAD 1:1.5 SLOPE 7" RISE														
W	NO. STEPS	2	3	4	5	6	7	8	9	10	11	12	13	14
2'	CONC.	0.20	0.29	0.38	0.47	0.56	0.65	0.74	0.83	0.92	1.01	1.10	1.19	1.28
	STEEL	10	13	16	20	24	28	30	34	38	42	46	48	52
3'	CONC.	0.27	0.39	0.51	0.63	0.75	0.88	1.00	1.12	1.24	1.36	1.48	1.60	1.73
	STEEL	13	18	21	27	32	38	41	46	52	57	63	65	71
4'	CONC.	0.34	0.49	0.64	0.80	0.95	1.10	1.25	1.40	1.56	1.71	1.86	2.01	2.17
	STEEL	17	23	27	34	41	48	52	59	66	73	80	83	90
5'	CONC.	0.41	0.59	0.78	0.96	1.14	1.33	1.51	1.69	1.88	2.06	2.24	2.42	2.61
,	STEEL	21	28	33	42	50	59	63	71	80	88	97	101	109
6'	CONC.	0.48	0.70	0.91	1.12	1.34	1.55	1.77	1.98	2.19	2.41	2.62	2.84	3.05
0	STEEL	24	33	39	49	59	69	74	84	94	104	114	118	128
				12	" TREA	.D	1:	2 SLOF	PE.	6″	RISE			
W	NO. STEPS	2	3	4	5	6	7	8	9	10	11	12	13	14
2'	CONC.	0.18	0.26	0.33	0.41	0.49	0.56	0.64	0.72	0.80	0.87	0.95	1.03	1.10
2	STEEL	10	12	16	19	23	25	29	33	36	39	42	46	50
3′	CONC.	0.25	0.35	0.45	0.56	0.66	0.76	0.87	0.97	1.07	1.18	1.28	1.38	1.49
,	STEEL	13	16	21	26	32	34	39	45	50	53	58	63	68
4'	CONC.	0.31	0.44	0.57	0.70	0.83	0.96	1.09	1.22	1.35	1.48	1.61	1.74	1.87
	STEEL	17	20	27	33	40	44	50	57	63	67	73	81	87
5′	CONC.	0.38	0.53	0.69	0.85	1.00	1.16	1.31	1.47	1.63	1.78	1.94	2.10	2.25
,	STEEL	21	25	33	41	49	53	61	69	77	82	89	98	105
6'	CONC.	0.44	0.62	0.81	0.99	1.17	1.36	1.54	1.72	1.90	2.09	2.27	2.45	2.64
	STEEL	24	29	39	48	58	62	71	81	90	96	105	115	124
				14:	TRE	AD	1	:3 SL0	OPE	4 🖁 "	RISE			
W	NO. STEPS	2	3	4	5	6	7	8	9	10	11	12	13	14
2'	CONC.	0.19	0.27	0.35	0.43	0.51	0.59	0.68	0.76	0.84	0.92	1.00	1.08	1.16
	STEEL	10	14	18	21	25	29	33	37	41	43	47	51	55
3′	CONC.	0.26	0.37	0.48	0.59	0.70	0.80	0.91	1.02	1.13	1.24	1.35	1.46	1.56
	STEEL	14	19	25	28	34	39	45	50	56	59	65	70	76
4'	CONC.	0.33	0.47	0.61	0.74	0.88	1.02	1.15	1.29	1.42	1.56	1.70	1.83	1.97
Ľ_	STEEL	18	25	32	36	43	50	57	64	71	75	82	89	96
5′	CONC.	0.40	0.57	0.73	0.90	1.06	1.22	1.39	1.55	1.72	1.88	2.05	2.21	2.38
	STEEL	22	30	39	44	52	61	69	78	86	91	100	108	117
6'	CONC.	0.47	0.66	0.86	1.05	1.24	1.43	1.63	1.82	2.01	2.21	2.40	2.59	2.78
L°_	STEEL	25	35	45	51	61	71	81	91	101	107	117	127	137

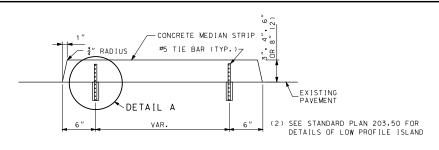




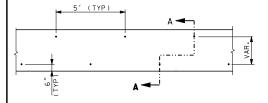
CONCRETE STAIRS

DATE EFFECTIVE: 04/01/2015
DATE PREPARED: 2/20/2015

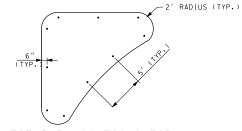
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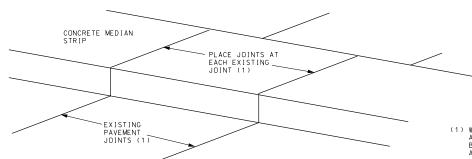
SECTION A-A CONCRETE MEDIAN STRIP



TIE BAR LOCATIONS FOR CONCRETE MEDIAN STRIP

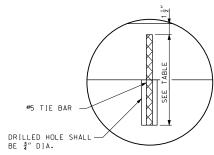


TIE BAR LOCATIONS FOR CONCRETE MEDIAN STRIP (ISLAND)



(1) WHEN THERE ARE NO VISIBLE JOINTS IN THE ADJACENT PAYEMENT. THE JOINT SPACING WILL BE EQUAL TO THE MEDIAN STRIP WIDTH. WITH A MINIMUM SPACING OF 10'.

CONCRETE MEDIAN STRIP JOINT LOCATION



DETAIL A

MEDIAN HEIGTH	BAR LENGTH
3″	8"
4"	9"
6"	11"
8"	13"

GENERAL NOTES:

TIE BARS SHALL BE EPOXY COATED. DEFORMED REINFORCING BARS MEETING THE REQUIREMENTS OF SECTION 710 AND 1057.

BONDING FOR TIE BARS SHALL BE EPOXY OR POLYESTER BONDING AGENTS AS SPECIFIED IN SECTION 1039.

THE FACE OF THE MEDIAN MAY BE CONSTRUCTED WITHOUT BATTER WHEN CONSTRUCTED ON A RADIUS OF 6' OR LESS.

WHEN CONCRETE MEDIANS ARE CONSTRUCTED DIRECTLY BENEATH GUARDRAIL. THE MEDIAN HEIGHT WILL BE 4".



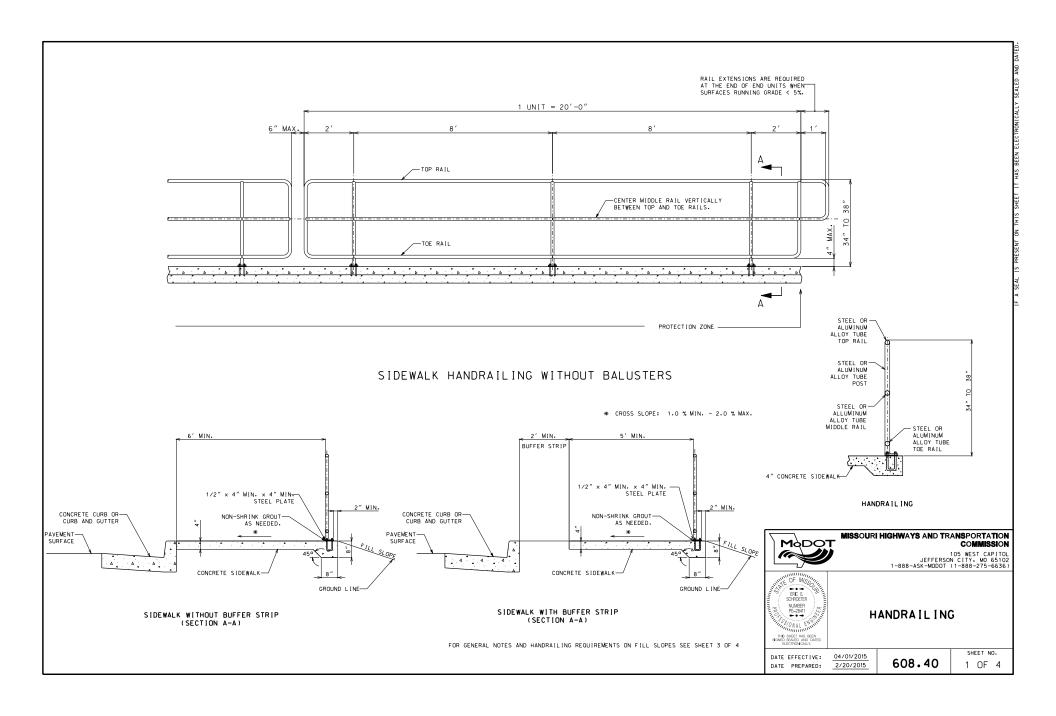
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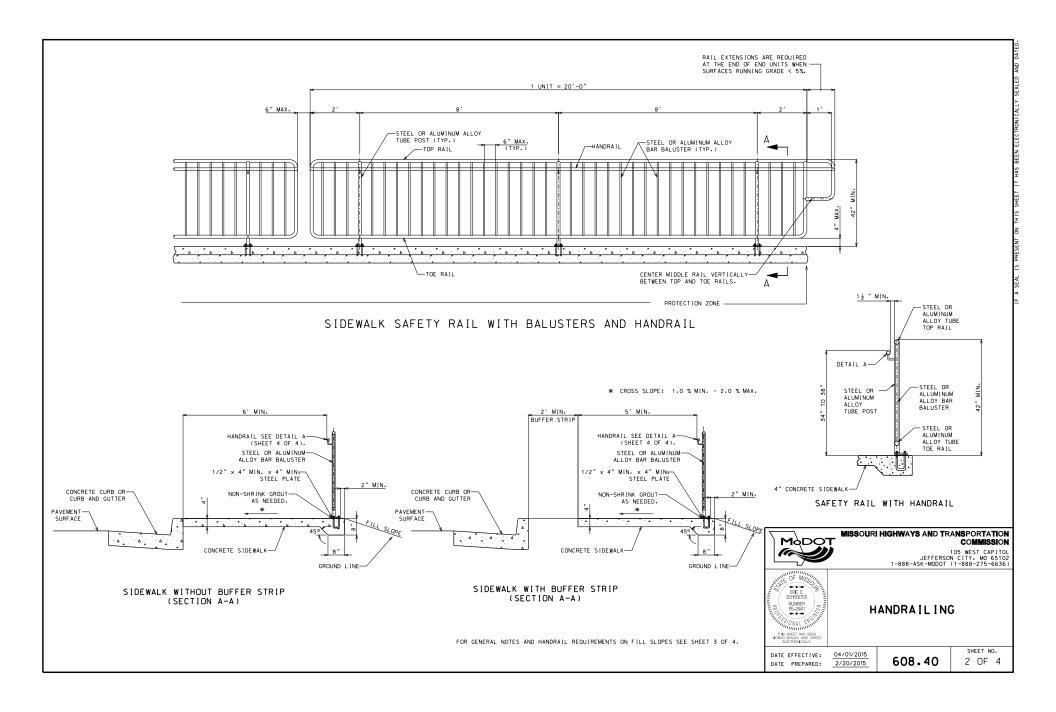


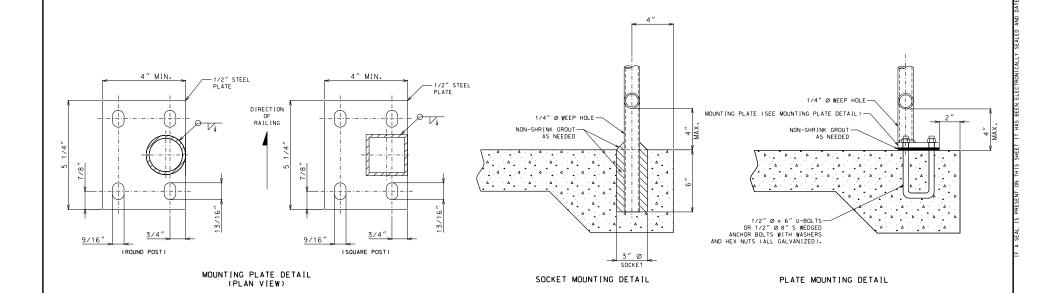
CONCRETE MEDIAN STRIP

DATE EFFECTIVE: 02/01/2011 DATE PREPARED: 3/9/2011

608.30A







HANDRAIL REQUIREMENTS						
FILL SLOPE	FILL HEIGHT	HANDRAIL				
(1V:3H) OR FLATTER		NOT REQUIRED				
(1V:3H) OR STEEPER	> 6 FT.	REQUIRED				
(1V:2H) OR STEEPER	> 4 FT.	REQUIRED				
(1V:1H) OR STEEPER	≥ 1 FT.	REQUIRED				

RAILING AND POST SPECIFICATION						
DESCRIPTION	TYPF	SIZE	WEIGHT (LBS. / FT.)			
DESCRIPTION	ITPE	(DIA.)	ALUM.	STEEL		
RAILING & POST	ROUND	1 1/2"	0.940	2.720		
MAILING & FUST	SQUARE	2" X 2"	1.3094	4.310		
	ROUND	1/2"	0.2312	0.668		
BALUSTER	RECT.	3/8" X 1/2" STL.		0.6375		
	SQUARE	1/2" X 1/2" ALUM.	0.2944			

MoDO	MISSOURI		COMMISSION 105 WEST CAPITOL N CITY, MO 65102
OF MISSING		HANDRAILII	NG
DATE EFFECTIVE: DATE PREPARED:	04/01/2015 2/20/2015	608.40	SHEET NO. 3 OF 4

RAILINGS AND POSTS MAY BE EITHER ROUND OR SOUARE STEEL OF GOOD COMMERCIAL WELDABLE QUALITY OR ALUMINUM ALLOY 6061-T6 OR 6063-T6.

STEEL RAILINGS AND POSTS SHALL BE GALVANIZED AFTER FABRICATION IN

METAL SAFETY RAIL MUST BE COMPLIANT WITH THE "AMERICAN'S WITH DISABLILITIES ACT ACCESSIBILITY GUIDELINES (ADAAD'". EXCEPTIONS MUST BE APPROVED BY THE ENGINEER. ALL OTHER AREAS OF NON-COMPLIANCE SHALL BE REMOVED AND CORRE

ALL JOINTS SHALL BE CONTINUOUS WELDED AND GROUND SMOOTH.

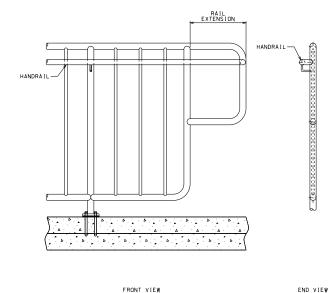
ALL POSTS SHALL HAVE A 1/4" WEEP HOLE IMMEDIATELY ABOVE THE MOUNTING PLATE.

WHEN INSTALLED THE POSTS SHALL BE PLUMB AND RAILINGS SHALL MATCH THE SLOPE OF THE SIDEWALK.

GENERAL NOTES:

ACCORDANCE WITH AASHTO M111.





HANDRAIL AND EXTENSION CONNECTION

CIRCULAR CROSS SECTION

4" - 6½" PERIMETER MAX.

4" - 6½" PERIMETER MAX.

HANDRAIL GRIPPING SURFACES

DETAIL A - HANDRAIL

HANDRAIL NOTES:

HANDRAILS SHALL BE STEEL OF GOOD COMMERCIAL WELDABLE QUALITY OR ALUMINUM ALLOY 6061-T6 OR 6063-T6.

HANDRAILS SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH AASHTO M111.

HANDRAILS SHALL BE AT A CONSISTENT HEIGHT ABOVE WALKING SURFACES.

HANDRAIL GRIPPING SUFFACES SHALL BE CONTINUOUS ALONG THEIR LENGTH AND SHALL NOT BE OBSTRUCTED ALONG THEIR TOPS OR SIDES.

THE BOTTOMS OF HANDRAIL GRIPPING SURFACES SHALL NOT BE OBSTRUCTED FOR MORE THAN 20 PERCENT OF THEIR LENGTH.

WHERE HANDPAILS ARE PROVIDED ALONG WALKING SUPFACES WITH SLOPES NOT STEERER THAN 13-00. THE BOTTOMS OF HANDRAIL OR IPPING SURFACES SHALL BE FERMITTED TO BE OBSTRUCTED ALONG THEIR ENTIRE LENGTH WHERE THEY ARE INTEGRAL TO CRASH RAILS OR BUMBER GUARDS.

THE DISTANCE BETWEEN HORIZONTAL PROJECTIONS AND THE BOTTOM OF THE GRIPPING SURFACE SHAUL, BE PERMITTED TO BE REDUCED BY 1 FOR ACCH 2 OF ADDITIONAL HANDRAIL PERIMETER DIMENSION THAT EXCEEDS 4".

HANDRAIL SURFACES AND ANY SURFACES ADJACEN TO THEM SHALL BE FREE OF SHARP OR ABRASIVE ELEMENTS AND SHALL HAVE ROUNDED EDGES.

HANDRAILS SHALL NOT ROTATE WITHIN THEIR FITTINGS.



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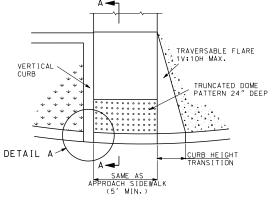
HANDRAIL ING

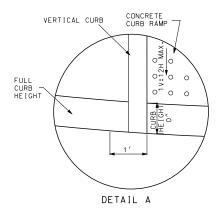
DATE EFFECTIVE: DATE PREPARED:

04/01/2015 2/20/2015

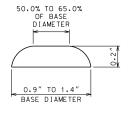
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SHEET NO.

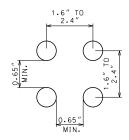




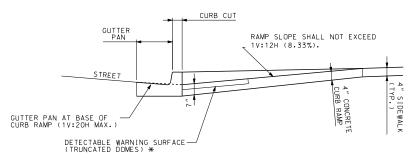
CURB RAMP DETAIL



TRUNCATED DOMES CROSS SECTION



TRUNCATED DOMES SPACING



SECTION A-A

** SOME DETECTABLE WARNING PRODUCTS REQUIRE A CONCRETE BORDER FOR PROPER INSTALLATION. THE CONCRETE BORDER SHALL NOT EXCEED 2 INCH PER SIDE.

GENERAL NOTES:

ALL AREAS OF THE PEDESTRIAN ACCESS ROUTE MUST BE COMPLIANT WITH THE AMERICANS WITH DISABLILITES ACT - GUIDELINES FOR ACCESSIBLE PUBLIC RIGHTS OF WAY". EXCEPTIONS MUST BE APPROVED BY THE ENGINEER. ALL OTHER AREAS OF NON-COMPLIANCE SHALL BE REMOVED AND CORRECTED AT THE CONTRACTOR'S EXPENSE.

THE SURFACES OF PEDESTRIAN ACCESS ROUTES AND ELEMENTS, AND SPACES REQUIRED TO CONNECT TO PEDESTRIAN ACCESS ROUTES, SHALL BE FIRM, STABLE, SLIP RESISTANT, AND SHALL NOT POND WATER.

SIDEWALK, RAMP AND LANDING CROSS SLOPES SHALL BE 1.00% TO FACILITATE DRAINAGE (2.00% MAX.).

THE CROSS SLOPE OF THE CONTINUOUS PEDESTRIAN ACCESS ROUTE THROUGH ENTRANCES. ALLEYS. AND SIDEROAD CONNECTIONS WITH STOP OR YIELD CONTROL SHALL BE 1.00% TO FACILITATE DRAINAGE (2.00% MAX.).

WHERE PEDESTRIAN ACCESS ROUTES ARE CONTAINED WITHIN PEDESTRIAN STREET CROSSINGS WITHOUT YIELD OR STOP CONTROL. THE CROSS SLOPE OF THE PEDESTRIAN ACCESS ROUTE SHALL BE 5.00% MAXIMUM.

WHERE PEDESTRIAN ACCESS ROUTES ARE CONTAINED WITHIN MIDBLOCK PEDESTRIAN STREET CROSSINGS, THE CROSS SLOPE OF THE PEDESTRIAN ACCESS ROUTE SHALL BE PERMITTED TO EQUAL THE STREET OR HIGHWAY GRADE.

 $30\ensuremath{^{\prime\prime}}\times$ 48 $^{\prime\prime}$ CLEAR SPACE SHALL BE PROVIDED CENTERED ON THE PEDESTRIAN PUSH BUTTON.

BEYOND THE BOTTOM GRADE BREAK OF A CURB RAMP, A CLEAR SPACE 4'MINIMUM BY 4'MINIMUM SHALL BE PROVIDED WITHIN THE WIDTH OF THE PEDESTRIAN STREET CROSSING AND WHOLLY OUTSIDE THE PARALLEL VEHICLE TRAVEL LANE.

SIDE FLARES OF CURB RAMPS. IN THE PATH OF PEDESTRIAN TRAVEL (TRAVERSABLE). SHALL NOT EXCEED A SLOPE OF 1V:10H. SIDE FLARES OUTSIDE THE PEDESTRIAN PATH (NONTRAVERSABLE) MAY BE VERTICAL.

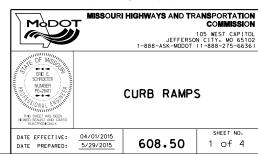
TRANSITION FROM SIDEWALK OR CURB RAMP TO GUTTER TO ROADWAY SHALL BE FLUSH.

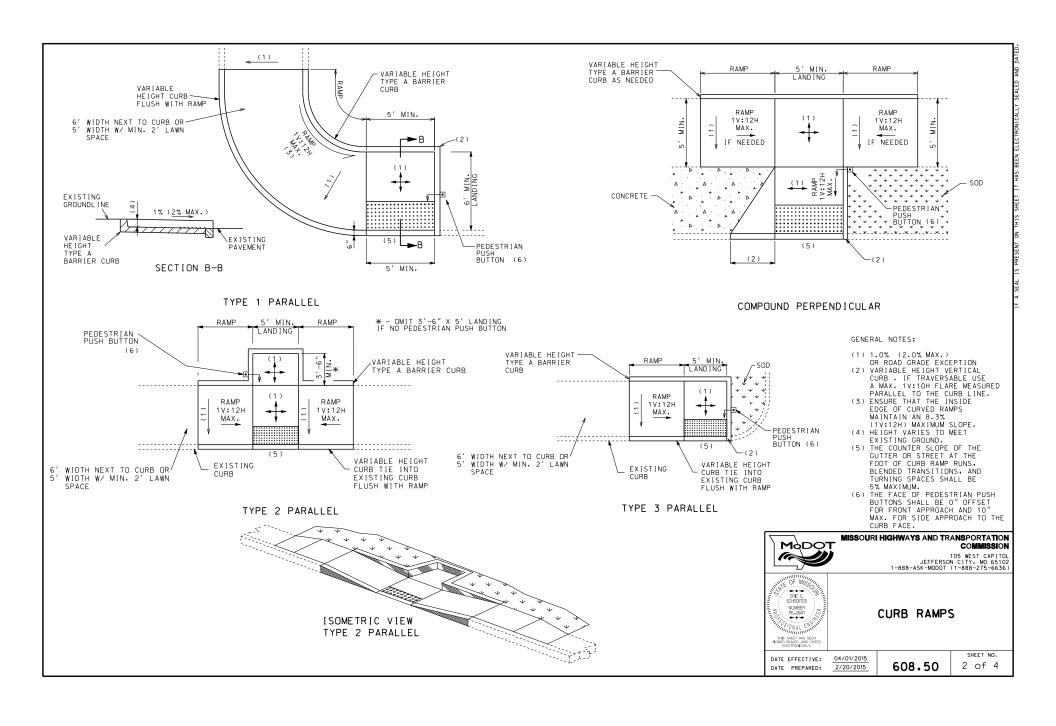
DETECTABLE WARNING SURFACES (TRUNCATED DOMES) SHALL BE PREFORMED AND INSTALLED AS PER MANUFACTURER'S RECOMENDATIONS. STAMPED CONCRETE WILL NOT BE ACCEPTED.

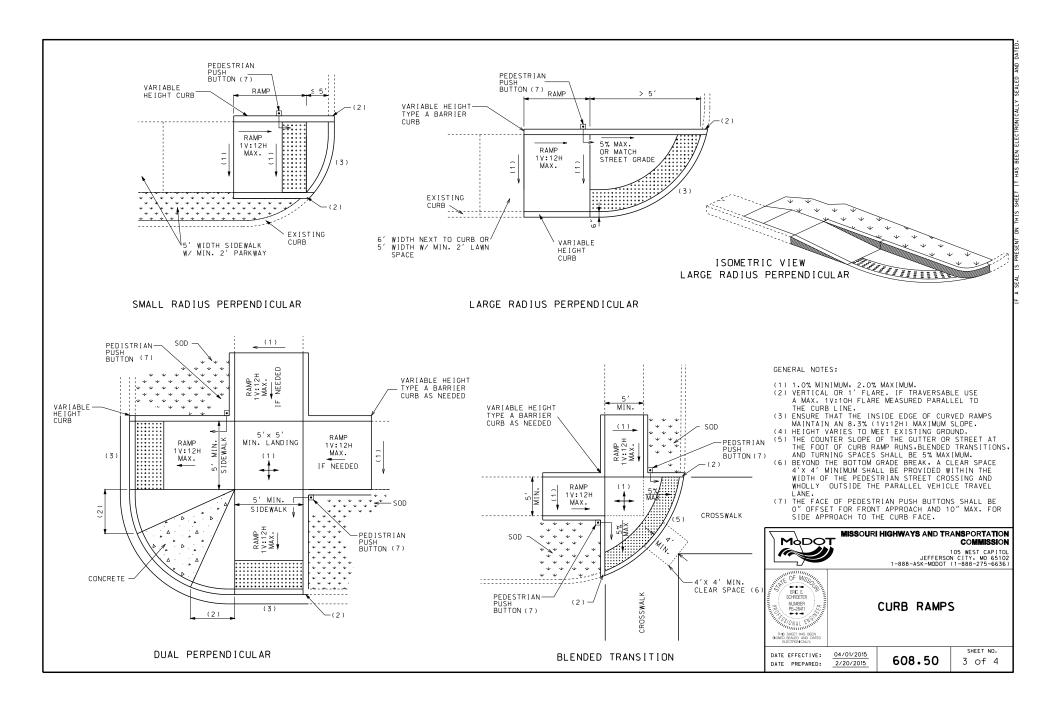
THE DETECTABLE WARNING SURFACE SHALL CONTRAST VISUALLY WITH ADJOINING SURFACES. EITHER LIGHT-ON-DARK OR DARK-ON-LIGHT. TRUNCATED DOMES SHALL SPAN THE FULL WIDTH OF THE RAMP OR LANDING 24" DEEP.

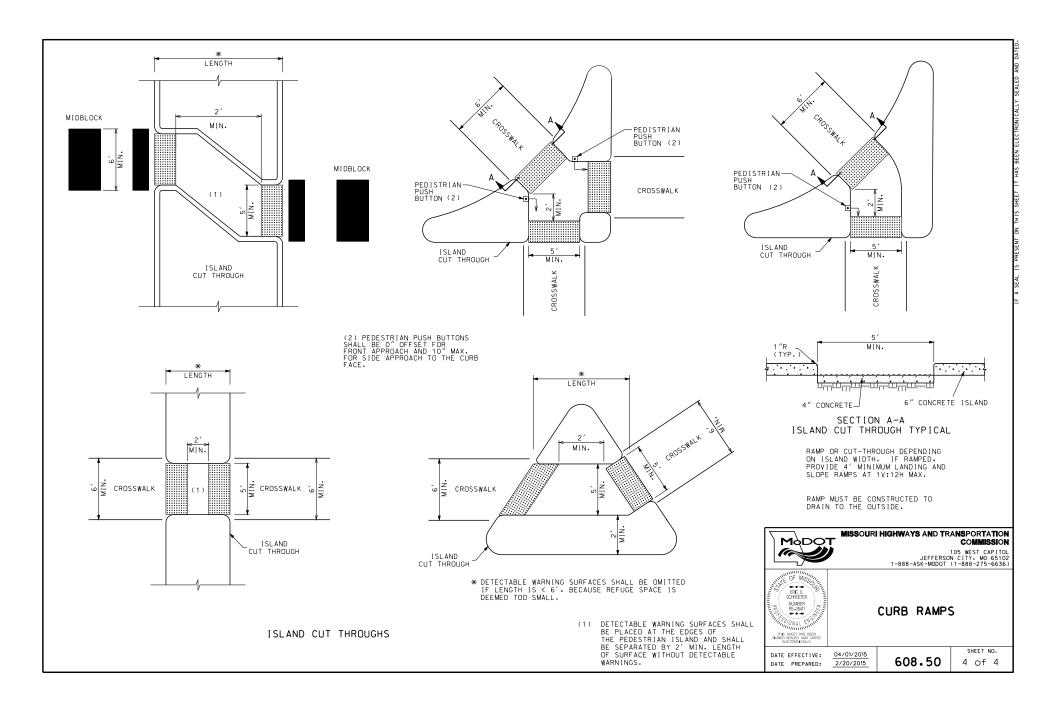
DETECTABLE WARNING SURFACES SHALL BE ALIGNED PERPENDICULAR OR RADIAL TO THE BREAK BETWEEN THE RAMP. LANDING OR BLENDED TRANSITION. AND THE STREET.

WHERE THE BOTTOM GRADE BREAK OF A CURB RAMP IS LESS THAN 5' FROM THE BACK OF CURB. DETECTABLE WARNINGS SHALL BE LOCATED ON THE RAMP SURFACE AT THE BACK OF THE CURB. WHERE THE GRADE BREAK IS GREATER THAN 5' FROM THE BACK OF CURB. THE DETECTABLE WARNING SHALL BE LOCATED ON THE LOWER LANDING.

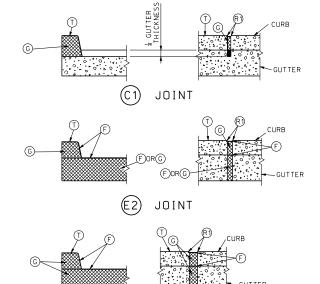








PLAN OF MEASUREMENT OF CURB & GUTTER AND JOINT PLAN



JOINT

- €) #" MAXIMUM WIDTH TRANSVERSE CONTRACTION JOINT (PREFORMED OR SAWED).
- $\ \textcircled{\ \ }$ 2" TRANSVERSE EXPANSION JOINT. (PREFORMED OR SAWED)
- (F) FILLER FOR JOINTS HOT POURED.
- (G) PREFORMED JOINT FILLER MATERIAL.
- (K) TONGUE & GROOVE JOINT WITH TIE BAR SEE DETAIL.
- M TONGUE & GROOVE JOINT WITHOUT TIE BARS SEE DETAIL.
- (N) NOT LESS THAN 10' OR MORE THAN 30'.
- (T) TOP OF CURB.
- (R) ROUND TO 4" RADIUS. (EXCEPT FOR SAWED JOINTS)

GNERAL NOTES:

A MINIMUM 4" TYPE 1 OR 5 AGGREGATE BASE SHALL BE PLACED BENEATH ALL CURB AND GUTTER SECTIONS AND INCLUDED WITHIN THE MAINLINE BASE PAY LIMITS.

WHEN CURBS ARE CONSTRUCTED DIRECTLY BENEATH GUARDRAIL, CURB HEIGHT SHALL BE 4 INCH BARRIER CURB, AS SHOWN ON STANDARD HEIGHT SHALL BE 4 INCH BARRIER CURB, AS SHOWN ON STANDARD PLAN 606.00.

CURB, GUTTER AND CURB AND CUTTER CONSTRUCTED ALONG AND ATTACHED TO CONCRETE PAVEMENT OR BASE SHALL HAVE:

- JOINT () ONE-QUARTER DEPTH OF CURB AND GUTTER THICKNESS AS A CONTINUATION OF EACH CONTRACTION JOINT IN THE BASE OR PAVEMENT.
- 2. JOINT (E) AS CONTINUATION OF 2" EXPANSION JOINT (E) IN THE CONCRETE BASE OR PAVEMENT SHALL EXTEND AND CONTINUE THROUGH THE CURB, CUTTER AND CURB AND GUTTER
- 3. JOINT (2) THROUGH CURB AND CURB AND CUTTER AT THE BE-GINNING AND END OF EACH PAVED APPROACH.

CURB, CURB AND GUTTER AND GUTTER CONSTRUCTED APART OR SEPARATED FROM CONCRETE BASE OR PAYEMENT OR AS A FORM FOR ASPHALTIC CONCRETE PAYEMENT SHALL HAVE A JOINT (E) ENTIRELY THROUGH THE CURB, CURB AND GUTTER AND GUTTER, AT BEGINNING AND END OF EACH "PAVED APPROACH" AND A JOINT © TO & DEPTH OF CURB AND GUTTER THICKNESS AT INTERVALS OF 30 FEET BETWEEN APPROACHES.

JOINTS (E) AND (E) THROUGH CURB SHALL BE FILLED WITH PREFORMED FILLER MATERIAL AND SEALED WITH HOT POURED FILLER FOR JOINTS.

JOINT (E) IN GUTTER SHALL BE FILLED WITH PREFORMED FILLER AND SEALED WITH HOT FILLER MATERIAL.

JOINT (2) IN GUTTER SHALL BE FILLED WITH PREFORMED FILLER AND SEALED WITH FILLER OR FILLED WITH HOT POURED FILLER.

PREFORMED FILLER MATERIAL SHALL BE PLACED TO PROVIDE 1" HOT POURED FILLER FOR JOINTS.

THE BARRIER CLASS CURBS MAY BE CONSTRUCTED WITHOUT BATTER WHEN CONSTRUCTED ON A RADIUS OF 6 FEET OR LESS. THE R2

WHERE A SIDEWALK INTERSECTS A CURB. THE SIDEWALK SHALL BE RAMPED NO STEEPER THAN 12:1 SLOPE TO PROVIDED ACCESS FOR WHEELCHAIR ACROSS APPROACHES.

WHEN ALLOWED BY THE ENGINEER. TYPES A AND B GUTTER MAY BE PRECAST TO CONFORM TO THE DIMENSIONS SHOWN. THE PRECASTER SHALL SUBMIT SHOP DRAWINGS INDICATING THE SECTION LENGTH. SECTION CONNECTION, AND PROPOSED JOINT SEALING SYSTEM. WHEN PRECAST SECTIONS CANNOT CONFORM TO ANY VERTICAL OR HORIZONTAL CURVE DESIGNATED ON THE PLANS. THE GUTTER SHALL BE CAST-IN-PLACE. A COMBINATION OF CAST-IN-PLACE AND PRECAST GUTTER MAY BE PERMITTED.



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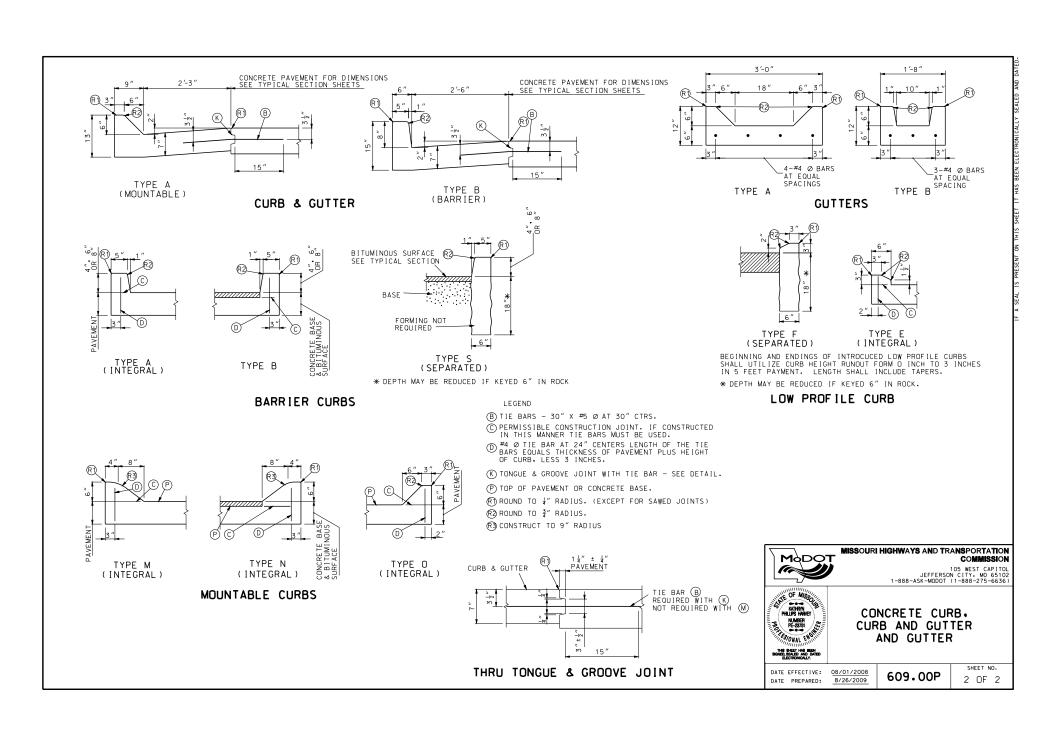
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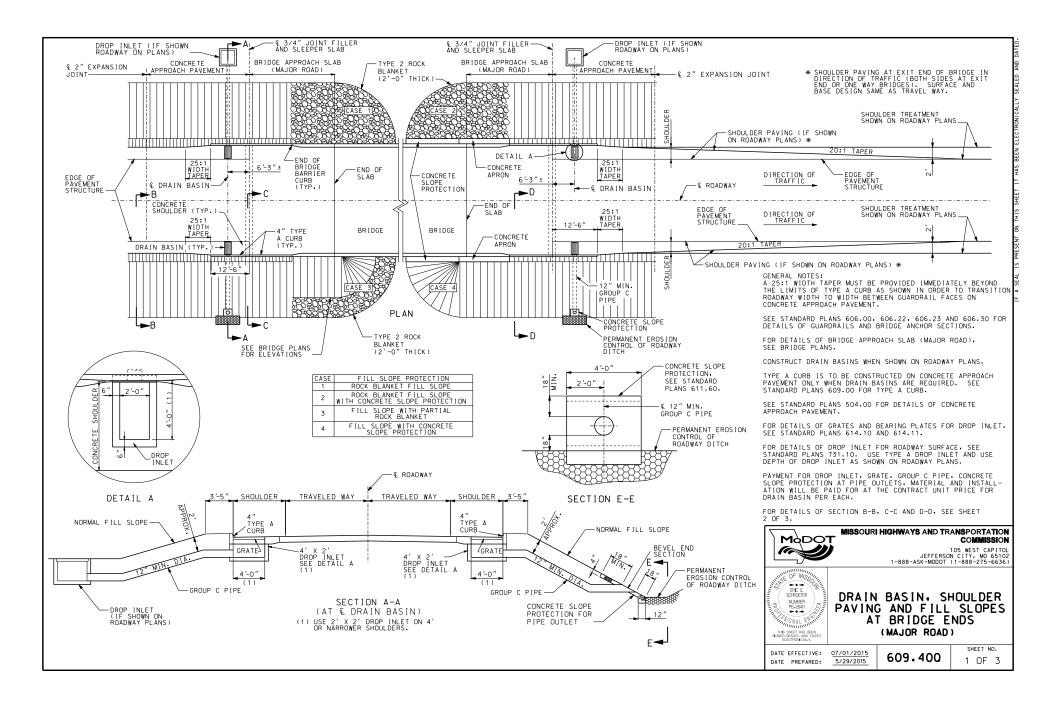


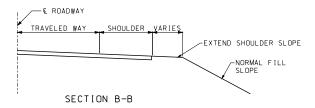
CONCRETE CURB. CURB AND GUTTER AND GUTTER

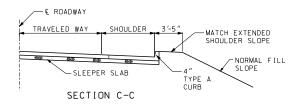
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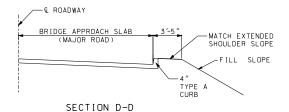
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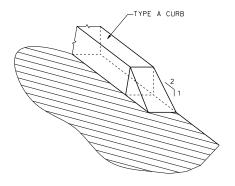








NOTE: FOR DETAILS NOT SHOWN. SEE OTHER SECTIONS.



TYPE A CURB TRANSITION DETAIL

GENERAL NOTE:

FOR LOCATION OF SEC. B-B, C-C AND D-D, SEE SHEET 1 OF 3.



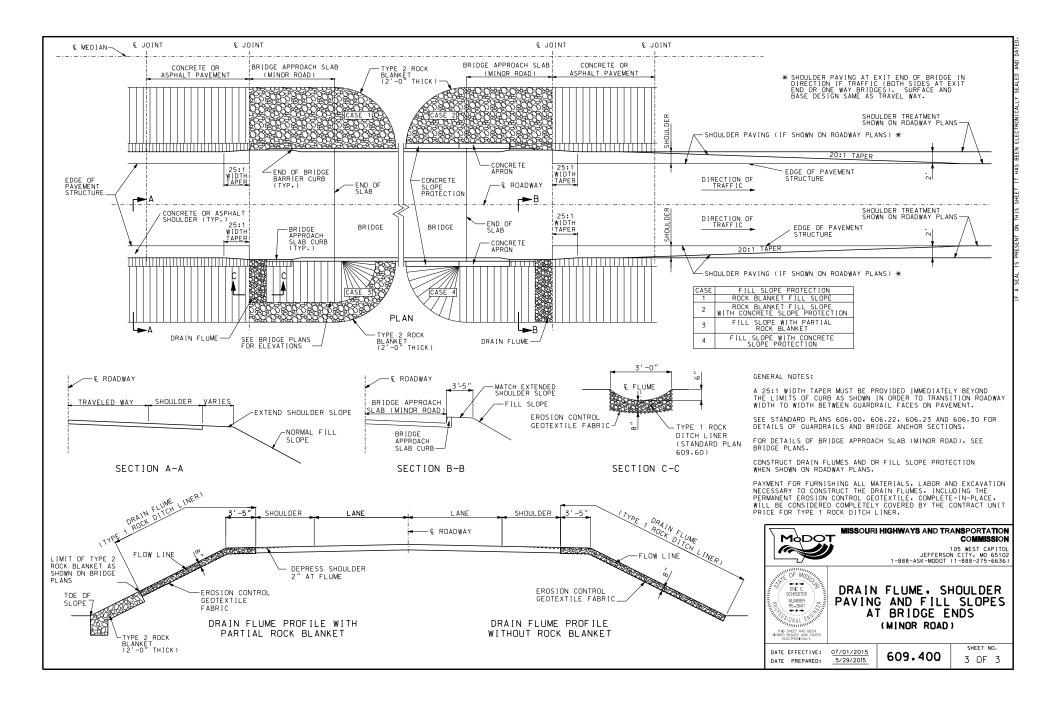
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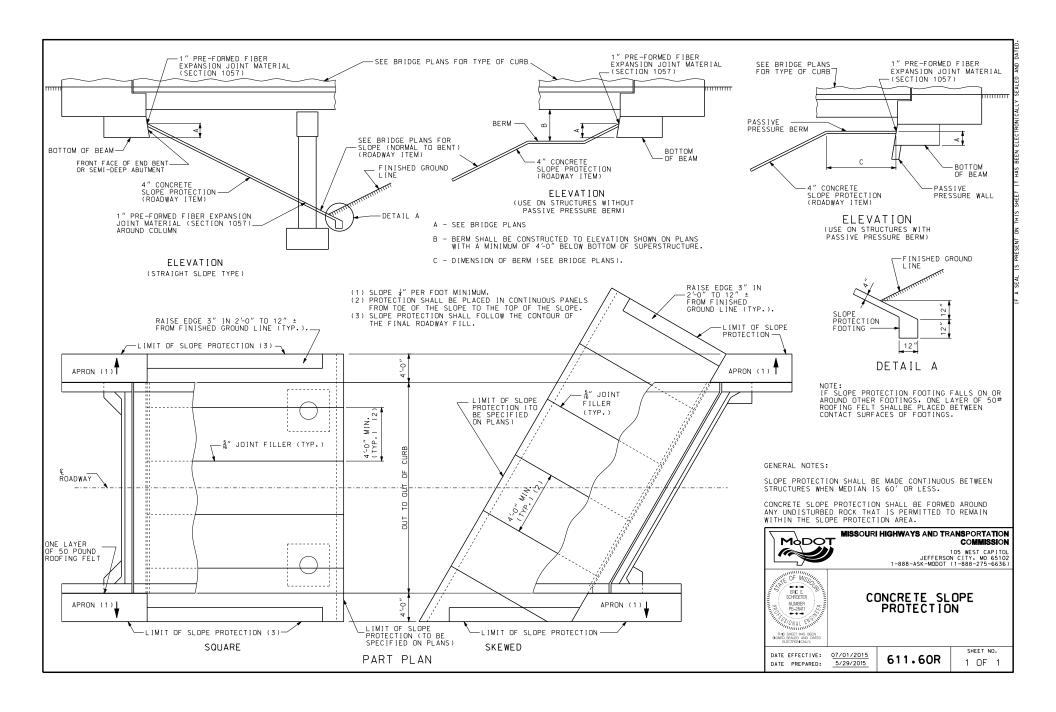


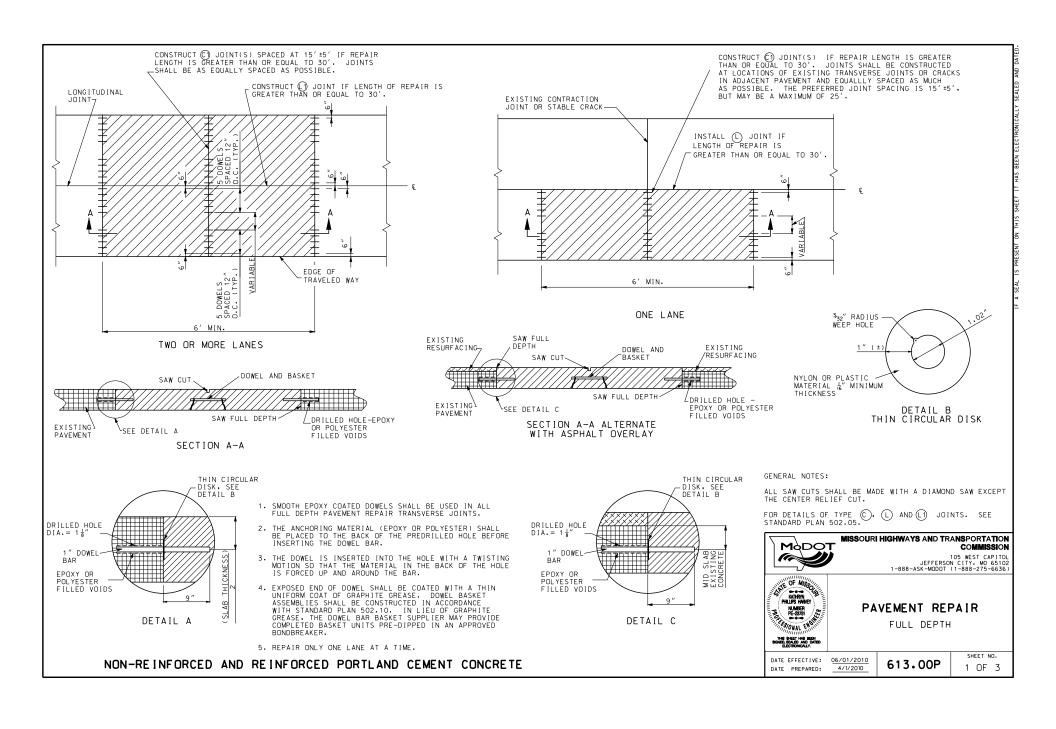
DRAIN BASIN. SHOULDER PAVING AND FILL SLOPE AT BRIDGE ENDS (MAJOR ROAD)

DATE EFFECTIVE: 07/01/2015 DATE PREPARED: 5/29/2015

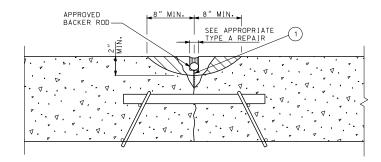
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PLAN VIEW



SECTION A-A MILLING OPTIONS

THE INITIAL RE-ESTABLISHMENT OF THE JOINT OR CRACK IN THE PLASTIC CONCRETE SHALL BE ACCOMPLISHED WITH AN APPROVED CUTTER BAR OR WITH MINIMUM 1/4° COMPRESSION RELIEF MATERIAL (SAWING NOT ALLOWED).

JOINT COMPRESSION RELIEF TO THE TOP OF THE DOWEL BARS SHALL BE PROVIDED BY A MINIMUM 1/4" SAWOUT AS SOON AS POSSIBLE AFTER INITIAL SET OR MINIMUM 1/4" COMPRESSION RELIEF MATERIAL AS NOTED ABOVE.

GENERAL NOTES:

THE LIMITS OF THE REMOVAL AREA WILL BE DEFINED BY THE ENGINEER.

ALL CONCRETE SHALL BE REMOVED TO LIMITS SHOWN IN THE DETAIL. INCLUDING DETERIORATED CONCRETE TO A MAXIMUM OF 1/2 THE PAVEMENT DEPTH OR TOP OF DOWELS BY MILLING.

EXPOSED SURFACE SHALL BE CLEANED BY SANDBLASTING. HIGH-PRESSURE WATER BLASTING OR OTHER METHODS APPROVED BY THE ENGINEER.

EXPOSED SURFACES OF DOWELS. IF ANY. SHALL BE COATED WITH AN APPROVED BOND BREAKER.

JOINTS AND CRACKS SHALL BE SEALED WITH APPROPRIATE SEALER.



AREA TO BE REMOVED

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PAVEMENT REPAIR PARTIAL DEPTH AT JOINTS AND CRACKS

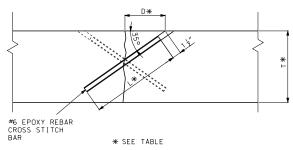
CLASS A THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

DATE EFFECTIVE: 06/01/2010 DATE PREPARED: 4/1/2010

613.00P

SHEET NO. 2 OF 3

CROSS STITCHING PLAN



Т	SLAB THICKNESS (IN)	8	9	10	11	12
D	DISTANCE TO HOLE (IN)	5 🖥	6 ½	7 4	8 ½	8 ½
L	LENGTH OF BAR (IN)	8 ½	11	12 ½	14	16

SECTION A-A

AT EACH REPAIR LOCATION, HOLES SHALL BE DRILLED AT 35° ANGLES TO THE PAVEMENT SURFACE, PERPENDICULAR TO THE CRACK. THE DRILL BIT DIAMETER SHALL NOT EXCEED $1\frac{1}{8}^{\prime\prime}$.

DRILLING SHALL ALTERNATE BACK AND FORTH ON EITHER SIDE OF THE LONGITUDINAL JOINT FROM HOLE TO HOLE.

DRILLED HOLES SHALL NOT PENETRATE THROUGH THE SLAB BOTTOM.

DRILLED HOLES SHALL BE CLEANED OF LOOSE DEBRIS AND DUST. EPOXY OR POLYESTER BONDING AGENTS FOR DOWELS, MEETING THE MATERIAL REQUIREMENTS OF SECTION 1039. MEETING THE MATERIAL REQUIREMENTS OF SECTION 1035. SHALL BE INJECTED OR POUNED INTO EACH HOLE. A CROSS-STITCH BAR SHALL BE INSERTED IN EACH HOLE SUCH THAT THE EPDXY MATERIAL IS EVENLY DISTRIBUTED AROUND THE BAR AND EXTRUDING FROM THE SURFACE OPENING. EACH BAR SHALL BE INSERTED FAR ENDUGH TO ALLOW 1½" OF COVER AS SHOWN IN THE PROFILE DETAIL.

THE SURFACE SHALL HAVE ALL EXCESS EPOXY REMOVED AND HAVE A FLUSH FINISH. GENERAL NOTES:



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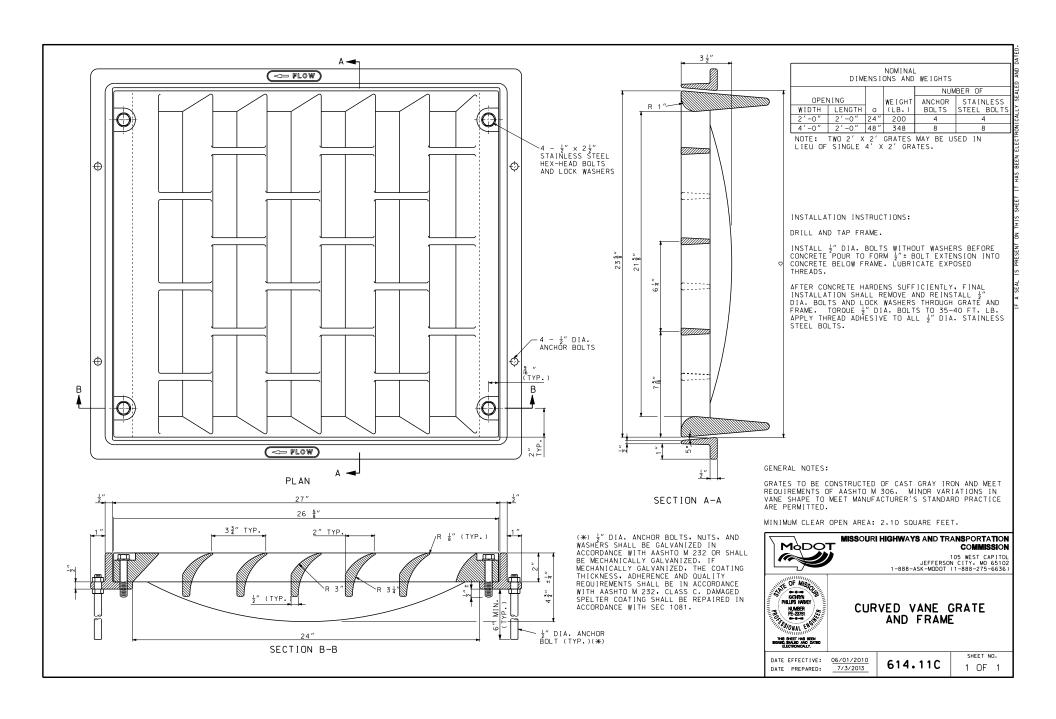
PAVEMENT REPAIR

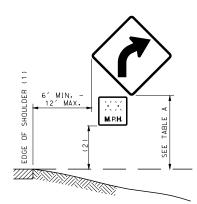
CROSS STITCHING

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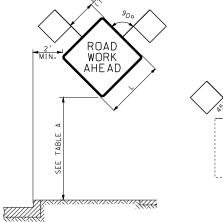
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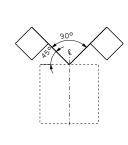
SHEET NO. 3 OF 3





- (1) EDGE OF TRAVELED WAY WHERE THERE IS NO PAVED OR STABILIZED SHOULDER.
- (2) ONE-FOOT LESS THAN MOUNTING HEIGHT NOTED IN TABLE A.





HEIGHT AND LATERAL LOCATIONS FOR POST AND PORTABLE SIGN MOUNTING

TYPE	SIGN SUPPORT	SIGN SUBSTRATE	MINIMUM MOUNTING HEIGHT(3)	USAGE LIMITATIONS	COMMENTS
	PERFORATED SOUARE STEEL TUBE U-CHANNEL WOOD	RIGID	5' RURAL UNDIVIDED HIGHWAYS 7' RURAL DIVIDED HIGHWAYS 7' URBAN HIGHWAYS	NONE	POSTS SHALL BE FREE OF ANY BRACING AND EXTEND NO FURTHER ABOVE THE SIGN EXCEPT AS NEEDED FOR WARNING LIGHT ATTACHMENT. SEE STANDARD PLAN 903.03 FOR POST INSTALLATION DETAILS. GALVANIZATION OF POSTS WILL NOT BE REQUIRED.
TYPE 1 PORTABLE	SKID FOLD-UP STAND	RIGID	5' RURAL UNDIVIDED HIGHWAYS 7' RURAL DIVIDED HIGHWAYS 7' URBAN HIGHWAYS	PERMITTED ONLY WHERE POST MOUNTING IS NOT FEASIBLE.	SYSTEMS SHALL COMPLY WITH CRASH TEST REQUIREMENTS OF NCHRP 350 TEST LEVEL 3 AND MAY BE PLACED ADJACENT TO OR WITHIN THE ROADWAY PROVIDED A MINIMUM LATERAL CLEARANCE OF 3 FEET, MEASURED HORIZONTALLY FROM THE EDGE OF THE SIGN TO THE EDGE OF DESIGNATED TRAVELED WAY, IS MAINTAINED.
	EASEL FOLD-UP STAND SELF-DRIVING POST TYPE III MOVABLE BARRICADE SKID	FLEXIBLE RIGID	12"(4)	ARE OBSCURED BY OTHER OBJECTS (I.E., TRAFFIC CONTROL DEVICES, PARKED VEHICLES, BARRIER, VEGETA- TION, ETC.) OR INSTALLED ON MULTI-	SYSTEMS SHALL COMPLY WITH CRASH TEST REQUIREMENTS OF NCHRP 350 TEST LEVEL 3 AND MAY BE PLACE ADJACENT TO OR WITHIN ROADWAY PROVIDED A MINIMUM LATERAL CLEARANCE OF 3 FEET. MEASURED HORIZONT—ALLY FROM THE EDGE OF THE SIGN TO THE EDGE OF THE SIGN TO THE EDGE OF THE AVELED WAY. IS MAINTAINED.
BARRIER	CONCRETE TRAFFIC BARRIER GUARDRAIL	FLEXIBLE RIGID	5' RURAL UNDIVIDED HIGHWAYS 7' RURAL DIVIDED HIGHWAYS 7' URBAN HIGHWAYS	BARRIER IS PRESENT.	SYSTEMS SHALL PROVIDE POSITIVE CON- NECTION TO THE BARRIER AND MINIMIZE POTENTIAL FOR VEHICLE SNAGGING.
	PAVEMENT MARKING EQUIPMENT PILOT CAR PROTECTIVE VEHICLE	FLEXIBLE RIGID	48" (6)	PERMITTED ONLY IN PILOT CAR OR MOVING OPERATIONS.	

- (3) MEASURED FROM THE BOTTOM OF THE SIGN TO THE NEAR EDGE OF THE PAVEMENT.
- (4) MOUNTING HEIGHTS FOR REGULATORY AND GUIDE SIGNS SHALL BE AS SPECIFIED FOR POST-MOUNTED SIGNS.
- (5) SIGNS MOUNTED ON TYPE III BARRICADES, GORE EXIT SIGN, AND SIGNS FOR CROSWALK/SIDEWALK CLOSURES MAY BE LEFT IN PLACE FOR MORE THAN 3 DAYS.
- (6) DEVIATIONS AS APPROVED BY THE ENGINEER.

TABLE A WORK ZONE SIGN MOUNTING REQUIREMENTS

	POST TYPE							
SIGN AREA (SQ.FT.)	U-CHANNEL	WOOD	PERF. SOUARE STEEL TUBING					
≤ 10	1 - 3.0 LB./FT.*	1 - 4" X 4" *	1 - 2" 12 GA.*					
> 10 ≤ 16	2 - 3.0 LB./FT.	2 - 4" X 4" 1 - 4" X 6"*	2 - 2" 12 GA.					
> 16 ≤ 24	2 - 3.0 LB./FT.	2 - 4" X 6"	3 - 2" 12 GA**					
> 24 ≤ 30	3 - 3.0 LB./FT.	2 - 4" X 6"	N/A					
> 30 ≤ 50	N/A	2 - 6" X 6"	N/A					

- * SIGNS GREATER THAN 4 FEET IN WIDTH, EXCEPT DIAMOND SHAPE SIGNS, REQUIRE TWO POSTS.
- ** REQUIRES SLIP BASE PER MANUFACTURER'S RECOMMENDATION.

TABLE B POST SIZE REQUIREMENTS

GENERAL NOTES:

LONGITUDINAL SPACING OF SIGNS SHOWN IN THE PLANS ARE PREFERRED MINIMUMS. BUT MAY BE ADJUSTED TO MEET EXISTING FIELD CONDITIONS WITH APPROVAL FROM THE

SIGNS SHALL NOT BE MOUNTED IN OR ON CHANNELIZERS.

ALL POSTS AND SIGNS SHALL BE INSTALLED AND MAINTAINED IN A PLUMB POSITION.

CONSTRUCTION SIGNS SHALL NOT BE LOCATED ON SIDEWALKS BICYCLE LANES. OR AREAS DESIGNATED FOR PEDESTRIAN OR BICYCLE TRAFFIC.

ALL BATTERY PACKS SEPARATE FROM WARNING LIGHT SHALL BE MOUNTED ON A SUPPORT POST NO HIGHER THAN 18" ABOVE GROUND LINE. IF USED. WARNING LIGHTS SHALL NOT COVER ANY PORTION OF THE SIGN FACE.



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TEMPORARY TRAFFIC CONTROL DEVICES

SIGN MOUNTING REQUIREMENTS

DATE EFFECTIVE: 08/01/2012 DATE PREPARED:

616.10A0

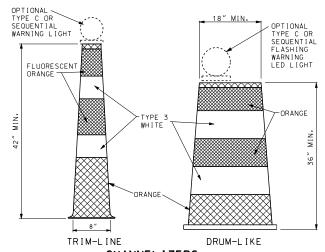
SHEET NO. 1 OF 8

DIRECTION INDICATOR BARRICADE

VERTICAL DIMENSIONS DO NOT INCLUDE PROJECTIONS DESIGNED FOR EASE OF HANDLING.

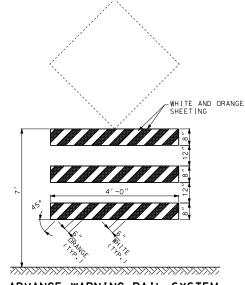
DIRECTION INDICATOR BARRICADES SHALL NOT BE USED IN SHIFTING TAPERS UNLESS SHOWN ON THE PLANS.

THE PANELS SHALL BE SECURELY ATTACHED TO A SUPPORT THAT IS PORTABLE. CAPABLE OF REMAINING UPRIGHT AND ENTIRELY FREE STANDING.



CHANNEL IZERS

REFLECTIVE SHEETING APPLIED TO CHANNELIZERS SHALL BE REBOUNDABLE MEETING ASTM D 4956.



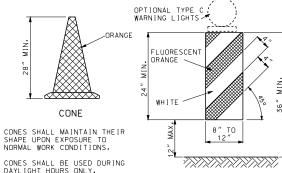
ADVANCE WARNING RAIL SYSTEM

MAXIMUM WEIGHT OF SIGN SHALL NOT EXCEED 25 LBS.

THE SIGN AND RAIL SYSTEM MAY BE MOUNTED AS TWO SEPARATE CRASHWORTHY DEVICES. THE RAIL SYSTEM SHALL BE LOCATED DIRECTLY IN FRONT OF THE SIGN WITH 7 TO 10 FEET SEPARATING THE TWO DEVICES

WHERE MARKING IS NOT PROVIDED ON THE BACKSIDE, STRIPS OF 3" WIDE MODOT TYPE 7 ORANGE SHEETING MAY BE APPLIED TO THE ENDS OF EACH RAIL TO HELP DELINEATE THE DEVICE.

WHITE AND ORANGE REFLECTIVE SHEETING SHALL BE IN ACCORDANCE WITH SEC 1042.2.7.3.



CONES SHALL BE USED DURING DAYLIGHT HOURS ONLY.

> VERTICAL PANELS SHALL BE SECURELY ATTACHED TO A SUPPORT THAT IS PORTABLE. CAPABLE OF REMAINING UPRIGHT AND ENTIRELY FREE STANDING.

VERTICAL PANEL

GENERAL NOTES:

FLUORESCENT ORANGE REFLECTIVE SHEETING SHALL IN ACCORDANCE WITH SEC 1042.2.7.3.

BALLAST FOR TRAFFIC CONTROL DEVICES SHALL CONFORM TO MANUFACTURERS' RECOMMENDATION FOR FIELD CONDITIONS WHEN APPLICABLE.

WHITE AND ORANGE REFLECTIVE SHEETING SHALL BE IN ACCORDANCE WITH SEC 1042.2.7.2.

IF REQUIRED BY THE ENGINEER OR SPECIFIED ON THE PLANS, EACH DIRECTION INDICATOR BARRICADE,
CHANNELIZER, AND VERTICAL PANEL SHALL BE EQUIPPED
WITH ONE TYPE C OR SEQUENTIAL FLASHING WARNING
PORTABLE LIGHT UNIT. IF USED, THE LIGHT UNIT AND
BATTERY COMPARTMENT SHALL BE FURNISHED BY THE DEVICE
MANUFACTURER OR OTHERWISE MEET THE MANUFACTURER'S RECOMMENDATIONS FOR DESIGN AND WILL BE REQUIRED ON ALL DEVICES IN THE SERIES.

UPON APPROVAL OF THE ENGINEER, THE CONTRACTOR MAY. AT NO ADDITIONAL COST, USE DRUM-LIKE CHANNELIZERS IN LIEU OF TRIM-LINE CHANNELIZERS TO PROVIDE LONG-ITUDINAL CHANNELIZATION WITHIN THE ACTIVITY AREA WHERE NO RAMPS. INTERSECTIONS OR LIMITED LATERAL CLEARANCE EXISTS.

UPON APPROVAL OF THE ENGINEER, THE CONTRACTOR MAY, AT NO ADDITIONAL COST, USE DIRECTION INDICATOR BARRI CADES IN LIEU OF TRIM-LINE CHANNELIZERS IN MERGING

UPON APPROVAL OF THE ENGINEER, THE CONTRACTOR MAY, AT NO ADDITIONAL COST, USE VERTICAL PANELS IN LIEU OF TRIM-LINE CHANNELIZERS TO PROVIDE LONGITUDINAL CHANNELIZATION WITHIN THE ACTIVITY AREA.

UPON APPROVAL OF THE ENGINEER, THE CONTRACTOR MAY. AT NO ADDITIONAL COST, USE CONES IN LIEU OF TRIM-LINE CHANNELIZERS DURING DAYTIME OPERATIONS ON MINOR ROUTES.

PANEL AND RAIL MARKINGS FOR TRAFFIC DELINEATION SHALL SLOPE DOWNWARD TOWARD THE INTENDED DIRECTION OF TRAVEL. ILLUSTRATIONS SHOWN ARE FOR INSTANCES WHERE TRAFFIC MOVES TO THE LEFT. REVERSE CONFIGURATIONS SHALL BE USED FOR TRAFFIC MOVEMENTS TO THE RIGHT.
MARKINGS SHALL ONLY BE APPLIED TO THE FRONT OF EACH
RAIL OR PANEL, OR MAY BE APPLIED TO BOTH THE FRONT AND BACK PROVIDING THE MARKING ON THE BACK DOES NOT CONFLICT WITH INTENDED OPPOSING TRAFFIC MOVEMENT.



MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)



TEMPORARY TRAFFIC CONTROL DEVICES

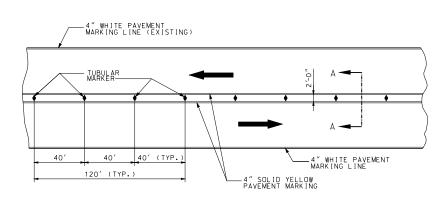
CHANNELIZERS AND DIRECTION INDICATOR BARRICADE

DATE EFFECTIVE: 08/01/2012 DATE PREPARED:

616.10A0

SHEET NO. 2 OF 8

STRIPES ON TRIM-LINE CHANNELIZERS SHALL BE 6" TO 8". STRIPES ON DRUM-LIKE CHANNELIZERS SHALL BE 4" TO 6".



TWO LANE / TWO WAY TRAFFIC DELINEATION PLAN FOR DIVIDED HIGHWAY

IF RAISED PAVEMENT MARKERS ARE PRESENT, THE LENSES SHALL BE REMOVED OR COVERED TO THE SATISFACTION OF THE ENGINEER.

ONE TYPE III MOVABLE BARRICADE WILL BE REQUIRED TO COMPLETELY CLOSE EACH 8' OF PAYEMENT. PAYED SHOULDERS SHALL BE INCLUDED IN THE AREA TO BE CLOSED.

SIGNS SHALL BE LIGHT WEIGHT (ROLL-UP OR PLASTIC) AND OBSCURE NO MORE THAN 50 PERCENT OF THE TOP 2 RAILS OR 33 PERCENT OF ALL THREE RAILS.

TYPE C WARNING LIGHTS SHALL BE LIGHT WEIGHT (3.3 LBS. OR LESS) OR HAVE BATTERY PACK MOUNTED NO HIGHER THAN 18-INCH AND SHALL NOT COVER ANY PORTION OF THE BARRICADED FACE.

IF SIGNS OR LIGHTS CANNOT MEET THE ABOVE REQUIREMENTS, THEY SHALL BE MOUNTED ON SEPARATE CRASHWORTHY DEVICES. LOCATED 7 TO 10 FEET BEHIND THE BARRICADE AND AT HEIGHTS SPECIFIED FOR POST MOUNTED SIGNS, LOCATED IN TABLE A ON SHEET 1.

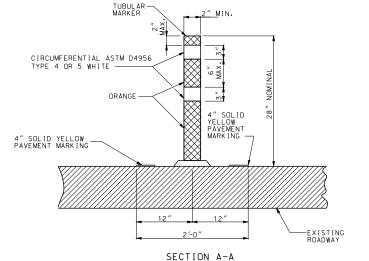
WHERE A BARRICADE ARRAY EXTENDS ACROSS A ROADWAY. THE STRIPES SHALL SLOPE DOWNWARD IN THE DIRECTION TOWARD WHICH TRAFFIC MUST TURN OR PASS.

WHERE BOTH RIGHT AND LEFT VEHICULAR MOVEMENTS ARE PROVIDED. THE STRIPES SHALL SLOPE DOWNWARD IN BOTH DIRECTIONS FROM THE CENTER

WHERE NO VEHICULAR MOVEMENTS ARE PROVIDED. THE STRIPES SHALL SLOPE DOWNWARD TOWARD THE CENTER OF THE BARRICADE ARRAY.

TYPE III MOVABLE BARRICADES SHALL BE ENTIRELY FREE STANDING AND PORTABLE. MARKING SHALL ONLY BE APPLIED TO THE FRONT OF EACH RAIL OR MAY BE APPLIED TO BOTH THE FRONT AND THE BACK OF EACH RAIL PROVIDED THE MARKING ON THE BACK DOES NOT CONFLICT WITH INTENDED OPPOSING TRAFFIC MOVEMENT. WHERE MARKING IS NOT PROVIDED ON THE BACKSIDE. STRIPS OF 3 WIDE ORANGE SHEETING MAY BE APPLIED TO THE ENDS OF EACH RAIL TO HELP DELINEATE THE DEVICE.

WHITE AND ORANGE REFLECTIVE SHEETING SHALL BE IN ACCORDANCE WITH SEC 104.2.7.3.

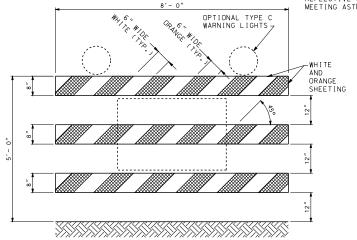


DATE PREPARED:

TUBULAR MARKER DETAIL

AN ADHESIVE, IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS, SHALL BE USED TO APPLY THE TUBULAR MARKER TO THE ROADWAY SURFACE. THE ADHESIVE SHALL PERMIT EASY REMOVAL OF THE TUBULAR MARKER WITHOUT DAMAGE TO THE ROADWAY SURFACE.

REFLECTIVE SHEETING APPLIED TO TUBULAR MARKERS SHALL BE REBOUNDABLE MEETING ASTM D4956.





3 OF 8

TYPE III MOVABLE BARRICADE

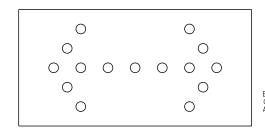
SPEED LIMIT AND STROBE LIGHT ASSEMBLY

THE ASSEMBLY MAY BE EITHER POST- OR PORTABLE-

THE ASSEMBLY SHALL ONLY BE USED AS SPECIFIED ON THE PLANS OR AS DIRECTED BY THE ENGINEER.

THE ASSEMBLY SHALL BE COVERED OR ROTATED SO THE SIGNS ARE NOT VISIBLE TO TRAFFIC WHEN WORK IS SUSPENDED OR THE CONDITION REQUIRING THE SPEED REDUCTION IS NOT PRESENT FOR 48 HOURS OR MORE.

THE STROBE LIGHTS SHALL BE TURNED OFF WHEN THE SPEED LIMIT IS NOT IN EFFECT.



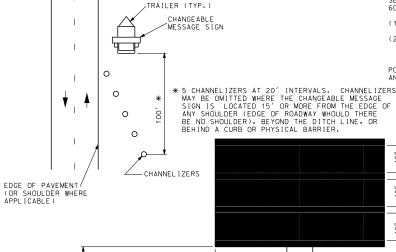
FLASHING ARROW PANEL REQUIREMENTS

PANEL MOUNTING HEIGHT SHALL BE AT LEAST 7 FEET FROM THE ROADWAY SURFACE TO THE LOWEST POINT ON THE PANEL. THE BOTTOM OF THE PANEL SHALL BE RELATIVELY LEVEL WHEN IN USE.

STROBE LIGHT REQUIREMENTS

STROBE LIGHTS SHALL BE SHIELDED SO THEY WILL NOT BE DIRECTLY VISIBLE FROM THE REAR. NO DIRECT PAYMENT WILL BE MADE FOR THE BATTERIES REQUIRED TO POWER THE STROBE LIGHTS.

AT THE CONTRACTOR'S OPTION. THE STROBE LIGHTS MAY BE CONTROLLED BY A SWITCH LOCATED ON THE SIGN OR MAY BE A STANDARD TWO—CHANNEL DIGITAL TRANSMITTER AND RECEIVER UNIT. IF THE TRANSMITTER AND RECEIVER WETHOD IS USED. ONE TRANSMITTER SHALL BE FURNISHED TO THE ENGINEER AT THE TIME OF INSTALLATION OF THE SPEED LIMIT ASSEMBLY. THE TRANSMITTER WILL BE RETURNED TO THE CONTRACTOR AT THE TRANSMITTER WILL BE RETURNED TO THE CONTRACTOR WILL REMAIN THE PROPERTY OF THE CONTRACTOR AFTER THE PROJECT IS COMPLETED. NO DIRECT PAYMENT WILL BE MADE FOR THE COST OF THE TRANSMITTER AND RECEIVERS



EDGE OF PAVEMENT (OR SHOULDER WHERE APPLICABLE) 6' MIN.

CHANGEABLE MESSAGE SIGN

PORTABLE WARNING LIGHTS

TYPE A

DUSK TO DAWN

LENS DIRECTIONAL FACES

MINIMUM ON-TIME(1)

HOURS OF OPERATION

FLASHING RATE PER MINUTE

LOW INTENSITY HIGH INTENSITY STEADY BURN FLASHING 1 OR 2 1 OR 2 55 TO 75 55 TO 75 CONSTANT 55 TO 75 10% 8% CONSTANT CONSTANT

TYPE C

DUSK TO DAWN 24 HRS/DAY

SEQUENTIAL

24 HRS/DAY TYPE A. TYPE C AND SEQUENTIAL LIGHTS SHALL BE VISIBLE ON A CLEAR NIGHT FROM A DISTANCE OF 3000 FEET(2).

TYPE B

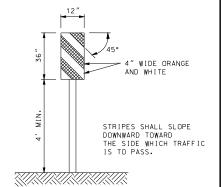
TYPE B LIGHTS SHALL BE VISIBLE ON A SUNNY DAY WHEN VIEWED WITHOUT THE SUN DIRECTLY ON OR BEHIND THE DEVICE FROM A DISTANCE OF 1000 FFFT(2).

SEQUENTIAL FLASHING WARNING LIGHTS SHALL BE PLACED WITHIN THE MERGING TAPER AND STILL COMMUNICATE WITH ANY LIGHT WITH THE SEQUENCE. THE LIGHTS SHOULD BE CAPABLE OF BEING SPACED AT LEAST 60 FEET AND MAY HAVE AN OFFSET CAPABILITY OF AT LEAST 6 FEET.

- (1) LENGTH OF TIME THAT INSTANTANEOUS INTENSITY IS EQUAL TO OR GREATER THAN EFFECTIVE INTENSITY.

 (2) THIS VISIBILITY MUST BE MAINTAINED WITHIN A SOLID ANGLE 9°
- ON EACH SIDE OF THE VERTICAL AXIS, AND 5° ABOVE AND 5° BELOW

PORTABLE WARNING LIGHTS SHALL BE BATTERY- OR SOLAR-POWERED AND CONSIST OF A SIGNLE UNIT (HEAD AND HOUSING).



TYPE 3 OBJECT MARKERS

WHITE AND ORANGE REFLECTIVE SHEETING SHALL BE IN ACCORDANCE WITH SEC 1042.2.7.3.



105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)

MISSOURI HIGHWAYS AND TRANSPORTATION

TEMPORARY PE-23751 TRAFFIC CONTROL DEVICES THIS SHEET HAS BEEN SIGNED, SEALED AND DATED OF POTENCIALLY

DATE EFFECTIVE: 08/01/2012 DATE PREPARED:

MODOT

7/26/2012

616.10AQ

SHEET NO. 4 OF 8

COMMISSION

WARNING SIGNS								
SIGN	SIZE	AREA	SYM.	LOR		DESCRIPTION		
SIGN			LEG. BRD.	BACK GROUND	SHEETING	DESCRIPTION		
SPECIAL	(IN.) 36X36	(SQ. FT.) 9.00	BRD.	FL. OR	R4	FRESH OIL/LOOSE GRAVEL (3)		
E05-2	48X36	12.00	BK	FL. OR	R4	EXIT OPEN		
E05-2a	48X36	12.00	BK	FL. OR	R4	EXIT CLOSED		
W01-1L	48X48	16.00	BK	FL. OR	R4	TURN (SYMBOL LEFT ARROW)		
WO1-1R	48X48	16.00	BK	FL. OR	R4	TURN (SYMBOL RIGHT ARROW)		
WO1-2L	48X48	16.00	ВК	FL. OR	R4	CURVE (SYMBOL LEFT ARROW)		
₩01-2R	48X48	16.00	BK	FL. OR	R4	CURVE (SYMBOL RIGHT ARROW)		
₩01-3L	48X48	16.00	BK	FL. OR	R4	REVERSE TURN (SYMBOL LEFT ARROW)		
₩01-3R	48X48	16.00	BK	FL. OR	R4	REVERSE TURN (SYMBOL RIGHT ARROW)		
₩01-4L	48X48	16.00	BK	FL. OR	R4	REVERSE CURVE (SYMBOL LEFT ARROW)		
WO1-4R	48X48	16.00	BK	FL. OR	R4	REVERSE CURVE (SYMBOL RIGHT ARROW)		
₩01-4bL	48X48	16.00	BK	FL. OR	R4	DOUBLE ARROW REVERSE CURVE (SYMBOL LEFT ARROWS) (2)		
₩01-4bR	48X48	16.00	BK	FL. OR	R4	DOUBLE ARROW REVERSE CURVE (SYMBOL RIGHT ARROWS) (2)		
W01-4cL	48X48	16.00	BK	FL. OR	R4	TRIPLE ARROW REVERSE CURVE (SYMBOL LEFT ARROWS) (2)		
W01-4cR W01-6	48X48 60X30	16.00	BK BK	FL. OR	R4 R4	TRIPLE ARROW REVERSE CURVE (SYMBOL RIGHT ARROWS) (2) HORIZONTAL ARROW (SYMBOL)		
W01-6a					R4	HORIZONTAL ARROW (SYMBOL ON PERMANENT BARRICADE) (1)		
W01-80	72X36 60X30	18.00	BK BK	FL. OR	R4	DOUBLE HEAD HORIZONTAL ARROW (SYMBOL)		
W01-7a	72X36	18.00	BK	FL. OR	R4	DOUBLE HEAD HORIZONTAL ARROW (SYMBOL ON PERMANENT BARRICADE)(1)		
WO1-8	18X24	3.00	BK	FL. OR	R4	CHEVRON (SYMBOL)		
W01-8a	30X36	7.50	BK	FL. OR	R4	CHEVRON (SYMBOL FOR DIVIDED HIGHWAYS)		
W03-1	48X48	16.00	BK	FL. OR	R4	STOP AHEAD (SYMBOL)		
WO3-2	48X48	16.00	ВК	FL. OR	R4	YIELD AHEAD (SYMBOL)		
WO3-3	48X48	16.00	BK	FL. OR	R4	SIGNAL AHEAD (SYMBOL)		
WO3-4	48X48	16.00	BK	FL. OR	R4	BE PREPARED TO STOP		
₩03-5	48X48	16.00	BK	FL. OR	R4	SPEED LIMIT AHEAD		
₩04-1L	48X48	16.00	BK	FL. OR	R4	MERGE (SYMBOL FROM LEFT)		
₩04-1R	48X48	16.00	BK	FL. OR	R4	MERGE (SYMBOL FROM RIGHT)		
W05-1	48X48	16.00	BK	FL. OR	R4	ROAD/BRIDGE/RAMP NARROWS (4)		
W05-3	48X48	16.00	BK	FL. OR	R4	ONE LANE BRIDGE		
W05-5 W06-1	48X48	16.00	BK	FL. OR	R4 R4	NARROW LANES (3)		
W06-1	48X48 48X48	16.00	BK BK	FL. OR	R4	DIVIDED HIGHWAY (SYMBOL) DIVIDED HIGHWAY END (SYMBOL)		
W06-3	48X48	16.00	BK	FL. OR	R4	TWO WAY TRAFFIC (SYMBOL)		
W07-3a	30X24	5.00	BK	FL. OR	R4	NEXT XX MILES (PLAQUE)		
WO8-1	48X48	16.00	BK	FL. OR	R4	BUMP		
WO8-2	48X48	16.00	BK	FL. OR	R4	DIP		
WO8-3	48X48	16.00	BK	FL. OR	R4	PAVEMENT ENDS		
₩08-4	48X48	16.00	ВК	FL. OR	R4	SOFT SHOULDER		
₩O8-5	48X48	16.00	BK	FL. OR	R4	SLIPPERY WHEN WET (SYMBOL)		
WO8-6	48X48	16.00	BK	FL. OR	R4	TRUCK CROSSING WITH FLAGS		
₩08-6c	48X48	16.00	BK	FL. OR	R4	TRUCK ENTRANCE (3)		
₩O8-7	36X36	9.00	BK	FL. OR	R4	LOOSE GRAVEL		
WO8-9	48X48	16.00	BK	FL. OR	R4	LOW SHOULDER		
W08-11	48X48	16.00	BK	FL. OR	R4	UNEVEN LANES		
W08-12	48X48	16.00	BK	FL. OR	R4	NO CENTER LINE		
W08-15	48X48 30X24	16.00	BK BK	FL. OR	R4 R4	GROOVED PAVEMENT MOTORCYCLE (PLAQUE)		
WO8-15p WO8-17	48X48	16.00	BK	FL. OR	R4	SHOULDER DROP-OFF (SYMBOL)		
W08-17 W08-17p	30X24	5.00	BK	FL. OR	R4	SHOULDER DROP-OFF (PLAQUE)		
₩10-1	42 RND.	9.62	BK	FL. YL	R4	RAILROAD CROSSING		
W012-1	24X24	4.00	BK	FL. OR	R4	DOUBLE DOWN ARROW (SYMBOL)		
W012-2	48X48	16.00	BK	FL. OR	R4	LOW CLEARANCE (SYMBOL)		
W012-2×	24X18	3.00	BK	FL. OR	R4	LOW CLEARANCE (PLAQUE) (3)		
W012-2a	84X24	14.00	BK	FL. OR	R4	OVERHEAD LOW CLEARANCE (FEET AND INCHES) (3)		
SPECIAL	120X60	50.00	ВК	FL. OR	R4	LOW CLEARANCE XX FT XX IN XX MILES AHEAD (3)		
SPECIAL	120X60	50.00	BK	FL. OR	R4	WIDTH RESTRICTION XX FT XX IN XX MILES AHEAD (3)		
W013-1	30X30	6.25	BK	FL. OR	R4	ADVISORY SPEED (PLAQUE)		
W016-2	30X24	5.00	BK	FL. OR	R4	XXX FEET (PLAQUE)		
W016-3	30X24	5.00	BK	FL. OR	R4	X MILE (PLAQUE)		
W020-1	48X48	16.00	BK	FL. OR	R4	ROAD/BRIDGE/RAMP WORK AHEAD (4)		
W020-2 W020-3	48X48	16.00	BK	FL. OR	R4	DETOUR AHEAD ROAD CLOSED AHEAD		
■ WUZU=3	48X48	16.00	BK	FL. OR	R4			
	40V40	16 00	DV					
W020-4 W020-5	48X48 48X48	16.00	BK BK	FL. OR	R4 R4	ONE LANE ROAD AHEAD RIGHT/CENTER/LEFT LANE CLOSED AHEAD (4)		

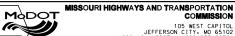
- (1) SIGN DEPICTION. ARROW. BORDERS AND SPACING SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF "STANDARD HIGHWAY SIGNS" BY THE U.S. DEPARTMENT OF TRANSPORTATION FHWA.
- (2) REFER TO THE LATEST EDITION OF MUTCH PART VI BY THE U.S. DEPARTMENT OF TRANSPORTATION FHWA FOR SIGN DEPICTION. ARROW, BORDERS AND SPACING SHALL CONFORM TO THE GUIDELINES SET FORTH IN THE LATEST EDITION OF STANDARD HIGHWAY SIGNS' BY THE U.S. DEPARTMENT OF TRANSPORTATION FHWA.
- (3) ARROW, BORDERS AND SPACING SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF "STANDARD HIGHWAY SIGNS" BY THE U.S. DEPARTMENT OF TRANSPORTATION FHWA.
- (4) USE OF A SUPPLEMENTAL PLATE FOR LINE 1 IS ACCEPTABLE.
- (5) PLAQUE AND APPLICABLE REGULATORY SIGN MAY BE MANUFACTURED AS ONE SIGN.
- (6) R4 REFER TO SEC 1042.2.7.3.

SIGN LAYOUTS SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF "STANDARD HIGHWAY SIGNS" BY THE U.S. DEPARTMENT OF TRANSPORTATION - FHWA, UNLESS SPECIFIED OTHERWISE.

SIGN DIMENSIONS SHOWN ARE MINIMUM. NO ADDITIONAL PAYMENT WILL BE MADE IF CONTRACTORS USE LARGER SIGNS.

NO ADDITIONAL PAYMENT WILL BE MADE FOR PLATES.

ALL PLAQUES SHALL HAVE A BORDER. PLATES SHALL NOT HAVE A BORDER.



105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)



TEMPORARY TRAFFIC CONTROL DEVICES

WARNING SIGNS

DATE PREPARED: 8/15/2012

DATE EFFECTIVE: 08/01/2012

616.10A0

SHEET NO. 5 OF 8

COMMISSION

					WARNI	NG SIGNS	
SIGN	SIZE	AREA		OR		050001071011	
SIGN			SYM.	BACK	SHEETING	DESCRIPTION	
	(IN.)	(SQ. FT.	BRD.	BACK GROUND			
V020-5a	48X48	16.00	BK	FL. OR	R4	2 RIGHT/CENTER/LEFT LANES CLOSED AHEAD	(4
SPECIAL WO20-6a	48X48	16.00	BK	FL. OR	R4	RIGHT/CENTER/LEFT LANE CLOSED	(3)(4
WO20-7	48X48	16.00	BK	FL. OR	R4	FLAGGER (SYMBOL) WITH FLAGS	
WO21-2	36X36	9.00	BK	FL. OR	R4	FRESH OIL	
SPECIAL WO21-5b	48X48	16.00	BK	FL. OR	R4	SHOULDER WORK AHEAD	(3
WO22-1	48X48	16.00	BK	FL. OR	R4	BLASTING ZONE AHEAD	
WO22-2	42X36	10.50	BK	FL. OR	R4	TURN OFF 2-WAY RADIO AND PHONE	
WO22-3	42X36	10.50	BK	FL. OR	R4	END BLASTING ZONE	
SPECIAL WO22-6e	21X15	2.19	ВК	FL. OR	R4	WET PAINT (ARROW PIVOTS)	(3
					GILID	I E SIGNS	
05-1	36X48	12.00	T DV	I OD	R4	GORE EXIT	
			BK	FL. OR			(3
G020-1	60X24	10.00	BK	FL. OR	R4	ROAD WORK NEXT XX MILES	
3020-2	48X24	8.00	BK	FL. OR	R4	END ROAD WORK	
3020-4	36X18	4.50	BK	FL. OR	R4	PILOT CAR FOLLOW ME	
SPECIAL	42X30	8.75	BK	FL. OR	R4	PLEASE WAIT FOR PILOT CAR	(3
020-5aP	36X24	6.00	BK	FL. OR	R4	WORK ZONE (PLAQUE)	(3) (
104-8a	24X18	3.00	BK	FL. OR	R4	END DETOUR	
/O4-9L	48X36	12.00	BK	FL. OR	R4	DETOUR (LEFT ARROW)	
/IO4-9R	48X36	12.00	BK	FL. OR	R4	DETOUR (RIGHT ARROW)	
MO4-10L	48X18	6.00	BK	FL. OR	R4	DETOUR (ARROW LEFT)	
MO4-10R	48X18	6.00	BK	FL. OR	R4	DETOUR (ARROW RIGHT)	
					REGUL A	TORY SIGNS	
R1 -1	48X48	13.25	WH	RD	R2	STOP	
R1 -2	48 TRI.	6.93	RD	WH	R2	YIELD	
R1-2a	36X36	9.00	BK	WH	R2	TO ONCOMING TRAFFIC (PLAQUE)	
R1 -3	20X9	1.25	WH	RD	R2	X-WAY (PLAQUE)	
R2-1	36X48	12.00	BK	WH	R2	SPEED LIMIT XX	
R3-1	48X48	16.00	BK/RD	WH	R2	NO RIGHT TURN (SYMBOL)	
₹3-2	48X48	16.00	BK/RD	WH	R2	NO LEFT TURN (SYMBOL)	
R3-3	36X36	9.00	BK	WH	R2	NO TURNS	
R3-4	48X48	16.00	BK/RD	WH	R2	NO U-TURN (SYMBOL)	
R3-7L	30X30	6.25		WH			
	30730				D2	LIEET LANE MUST TURN LEET	
07_7D	30730		BK		R2	LEFT LANE MUST TURN LEFT	
	30X30	6.25	ВК	WН	R2	RIGHT LANE MUST TURN RIGHT	
R4-1	36X48	6.25 12.00	BK BK	WH WH	R2 R2	RIGHT LANE MUST TURN RIGHT DO NOT PASS	
R4-1 R4-2	36X48 36X48	6.25 12.00 12.00	BK BK BK	WH WH	R2 R2 R2	RIGHT LANE MUST TURN RIGHT DO NOT PASS PASS WITH CARE	
R4-1 R4-2 R4-7a	36X48 36X48 36X48	6.25 12.00 12.00 12.00	BK BK BK BK	WH WH WH	R2 R2 R2 R2	RIGHT LANE MUST TURN RIGHT DD NOT PASS PASS WITH CARE KEEP RIGHT (HORIZONTAL ARROW)	
R4-1 R4-2 R4-7a R4-8a	36X48 36X48 36X48 36X48	6.25 12.00 12.00 12.00 12.00	BK BK BK BK	WH WH WH WH	R2 R2 R2 R2 R2	RIGHT LANE MUST TURN RIGHT DD NOT PASS PASS WITH CARE KEEP RIGHT (HORIZONTAL ARROW) KEEP LEFT (HORIZONTAL ARROW)	
R4-1 R4-2 R4-7a R4-8a R5-1	36X48 36X48 36X48 36X48 30X30	6.25 12.00 12.00 12.00 12.00 6.25	BK BK BK BK BK RD	WH WH WH WH WH	R2 R2 R2 R2 R2 R2 R2	RIGHT LANE MUST TURN RIGHT DD NOT PASS PASS WITH CARE KEEP RIGHT (HORIZONTAL ARROW) KEEP LEFT (HORIZONTAL ARROW) DO NOT ENTER	
R4-1 R4-2 R4-7a R4-8a R5-1	36X48 36X48 36X48 36X48 30X30 36X24	6.25 12.00 12.00 12.00 12.00 6.25 6.00	BK BK BK BK RD WH	WH WH WH WH WH WH RD	R2 R2 R2 R2 R2 R2 R2 R2	RIGHT LANE MUST TURN RIGHT DD NOT PASS PASS WITH CARE KEEP RIGHT (HORIZONTAL ARROW) KEEP LEFT (HORIZONTAL ARROW) DD NOT ENTER WRONG WAY	
R4-1 R4-2 R4-7a R4-8a R5-1 R5-1a	36X48 36X48 36X48 36X48 30X30 36X24 48X18	6.25 12.00 12.00 12.00 12.00 6.25 6.00 6.00	BK BK BK BK BK RD WH BK	WH WH WH WH WH WH RD	R2 R2 R2 R2 R2 R2 R2 R2 R2	RIGHT LANE MUST TURN RIGHT DD NOT PASS PASS WITH CARE KEEP RIGHT (HORIZONTAL ARROW) KEEP LEFT (HORIZONTAL ARROW) DD NOT ENTER WRONG WAY ONE WAY ARROW (LEFT)	
24-1 24-2 24-7a 24-8a 25-1 25-1a 26-1L	36X48 36X48 36X48 36X48 30X30 36X24 48X18 48X18	6.25 12.00 12.00 12.00 12.00 6.25 6.00 6.00	BK BK BK BK RD WH BK BK	WH WH WH WH WH RD WH	R2 R2 R2 R2 R2 R2 R2 R2 R2 R2	RIGHT LANE MUST TURN RIGHT DD NOT PASS PASS WITH CARE KEEP RIGHT (HORIZONTAL ARROW) KEEP LEFT (HORIZONTAL ARROW) DD NOT ENTER WRONG WAY ONE WAY ARROW (LEFT) ONE WAY ARROW (RIGHT)	
84-1 84-2 84-7a 84-8a 85-1 85-1a 86-1L 86-1R	36X48 36X48 36X48 36X48 30X30 36X24 48X18 48X18 24X30	6.25 12.00 12.00 12.00 12.00 6.25 6.00 6.00 6.00 5.00	BK BK BK BK RD WH BK BK BK	WH WH WH WH WH RD WH WH WH	R2 R2 R2 R2 R2 R2 R2 R2 R2 R2 R2	RIGHT LANE MUST TURN RIGHT DO NOT PASS PASS WITH CARE KEEP RIGHT (HORIZONTAL ARROW) KEEP LEFT (HORIZONTAL ARROW) DO NOT ENTER WHONG WAY ONE WAY ARROW (LEFT) ONE WAY ARROW (RIGHT) ONE WAY (LEFT)	
R4-1 R4-2 R4-7a R4-8a R5-1 R5-1a R6-1L R6-1R R6-2L	36X48 36X48 36X48 36X48 30X30 36X24 48X18 48X18 24X30 24X30	6.25 12.00 12.00 12.00 12.00 6.25 6.00 6.00 6.00 5.00	BK BK BK BK RD WH BK BK BK BK	WH WH WH WH WH RD WH	R2 R2 R2 R2 R2 R2 R2 R2 R2 R2 R2 R2	RIGHT LANE MUST TURN RIGHT DD NOT PASS PASS WITH CARE KEEP RIGHT (HORIZONTAL ARROW) KEEP LEFT (HORIZONTAL ARROW) DO NOT ENTER WRONG WAY ONE WAY ARROW (LEFT) ONE WAY ARROW (RIGHT) ONE WAY (LEFT) ONE WAY (LEFT) ONE WAY (RIGHT)	
84-1 84-2 84-8a 85-1 85-1a 86-1L 86-1L 86-2L 86-2R 810-6	36X48 36X48 36X48 36X48 30X30 36X24 48X18 48X18 24X30 24X30 24X36	6.25 12.00 12.00 12.00 6.25 6.00 6.00 6.00 5.00 6.00	BK BK BK BK BK RD WH BK BK BK BK BK	WH WH WH WH WH RD WH WH WH	R2 R2 R2 R2 R2 R2 R2 R2 R2 R2 R2 R2	RIGHT LANE MUST TURN RIGHT DD NOT PASS PASS WITH CARE KEEP RIGHT (HORIZONTAL ARROW) KEEP LEFT (HORIZONTAL ARROW) DD NOT ENTER WRONG WAY ONE WAY ARROW (LEFT) DNE WAY ARROW (RIGHT) ONE WAY (RIGHT) STOP HERE ON RED (45° ARROW)	
24-1 24-7 24-7 24-8 25-1 25-1 25-1 26-1L 26-1R 26-2L 26-2L 26-2R 210-6 2111-2	36X48 36X48 36X48 36X48 30X30 36X24 48X18 48X18 24X30 24X30 24X36 48X30	6.25 12.00 12.00 12.00 12.00 6.25 6.00 6.00 5.00 5.00 6.00	BK BK BK BK BK RD WH BK BK BK BK BK	WH WH WH WH WH RD WH WH WH WH WH	R2 R2 R2 R2 R2 R2 R2 R2 R2 R2 R2 R2	RIGHT LANE MUST TURN RIGHT DO NOT PASS PASS WITH CARE KEEP RIGHT (HORIZONTAL ARROW) KEEP LEFT (HORIZONTAL ARROW) DO NOT ENTER WRONG WAY ONE WAY ARROW (LEFT) ONE WAY ARROW (RIGHT) ONE WAY (LEFT) ONE WAY (LEFT) ONE WAY (LEFT) ONE WAY (RIGHT) STOP HERE ON RED (45° ARROW) ROAD CLOSED	
84-1 84-7 84-7a 84-8a 85-1 85-1a 86-1L 86-1R 86-2L 86-2L 86-2C 810-6	36X48 36X48 36X48 36X48 30X30 36X24 48X18 48X18 24X30 24X30 24X36	6.25 12.00 12.00 12.00 6.25 6.00 6.00 6.00 5.00 6.00	BK BK BK BK BK RD WH BK BK BK BK BK	WH WH WH WH WH RD WH WH WH WH	R2 R2 R2 R2 R2 R2 R2 R2 R2 R2 R2 R2	RIGHT LANE MUST TURN RIGHT DD NOT PASS PASS WITH CARE KEEP RIGHT (HORIZONTAL ARROW) KEEP LEFT (HORIZONTAL ARROW) DD NOT ENTER WRONG WAY ONE WAY ARROW (LEFT) DNE WAY ARROW (RIGHT) ONE WAY (RIGHT) STOP HERE ON RED (45° ARROW)	
R4-1 R4-2 R4-70 R4-80 R5-1 R5-1a R6-1L R6-1L R6-2L R6-2R R10-6 R10-6 R11-2	36X48 36X48 36X48 36X48 30X30 36X24 48X18 48X18 24X30 24X30 24X36 48X30	6.25 12.00 12.00 12.00 12.00 6.25 6.00 6.00 5.00 5.00 6.00	BK BK BK BK BK RD WH BK BK BK BK BK	WH WH WH WH WH RD WH WH WH WH WH WH WH	R2 R2 R2 R2 R2 R2 R2 R2 R2 R2 R2 R2 R2	RIGHT LANE MUST TURN RIGHT DO NOT PASS PASS WITH CARE KEEP RIGHT (HORIZONTAL ARROW) KEEP LEFT (HORIZONTAL ARROW) DO NOT ENTER WRONG WAY ONE WAY ARROW (LEFT) ONE WAY ARROW (RIGHT) ONE WAY (LEFT) ONE WAY (LEFT) ONE WAY (LEFT) ONE WAY (RIGHT) STOP HERE ON RED (45° ARROW) ROAD CLOSED	
R3-7R R4-11 R4-2 R4-7a R4-8a R5-1a R5-1a R6-1L R6-2L R6-2L R6-2R R10-6 R11-2 R11-3a R11-4 CONST-3A	36×48 36×48 36×48 36×48 30×30 36×24 48×18 24×30 24×30 24×30 60×30	6.25 12.00 12.00 12.00 6.25 6.00 6.00 5.00 5.00 6.00 10.00	BK BK BK BK BK RD WH BK BK BK BK BK BK BK	WH W	R2 R2 R2 R2 R2 R2 R2 R2 R2 R2 R2 R2 R2 R	RIGHT LANE MUST TURN RIGHT DD NOT PASS PASS WITH CARE KEEP RIGHT (HORIZONTAL ARROW) KEEP LEFT (HORIZONTAL ARROW) DD NOT ENTER WRONG WAY ONE WAY ARROW (LEFT) ONE WAY ARROW (RIGHT) ONE WAY (LEFT) ONE WAY (RIGHT) STOP HERE ON RED (45° ARROW) ROAD CLOSED ROAD CLOSED XX MILES AHEAD LOCAL TRAFFIC ONLY	(;
R4-1 R4-2 R4-7a R4-8a R5-1 R5-1a R6-1L R6-1R R6-2L R6-2L R6-2L R11-3 R11-4 R11-3	36×48 36×48 36×48 36×48 30×30 36×24 48×18 48×18 24×30 24×30 24×36 48×36 60×30 60×30	6.25 12.00 12.00 12.00 12.00 6.25 6.00 6.00 5.00 5.00 6.00 10.00	BK BK BK BK BK RD WH BK BK BK BK BK BK BK BK BK	WH WH WH WH WH WH RD WH WH WH WH WH WH WH WH	R2 R2 R2 R2 R2 R2 R2 R2 R2 R2 R2 R2 R2 R	RIGHT LANE MUST TURN RIGHT DO NOT PASS PASS WITH CARE KEEP RIGHT (HORIZONTAL ARROW) KEEP LEFT (HORIZONTAL ARROW) DO NOT ENTER WRONG WAY ONE WAY ARROW (LEFT) ONE WAY ARROW (RIGHT) ONE WAY (RIGHT) ONE WAY (RIGHT) STOP HERE ON RED (45° ARROW) ROAD CLOSED ROAD CLOSED X MILES AHEAD LOCAL TRAFFIC ONLY ROAD CLOSED TO THRU TRAFFIC	
R4-1 R4-2 R4-7a R4-8a R5-1 R5-1a R6-1R R6-1R R6-2L R6-2R R10-6 R11-2 R11-3a R11-4 CONST-3A	36×48 36×48 36×48 30×30 36×24 48×18 48×18 24×30 24×30 24×36 48×30 60×30 60×30 60×48	6.25 12.00 12.00 12.00 6.25 6.00 6.00 5.00 6.00 10.00 12.50 20.00	BK BK BK BK BK RD WH BK BK BK BK BK BK BK BK BK	WH W	R2 R2 R2 R2 R2 R2 R2 R2 R2 R2 R2 R2 R2 R	RIGHT LANE MUST TURN RIGHT DD NOT PASS PASS WITH CARE KEEP RIGHT (HORIZONTAL ARROW) KEEP LEFT (HORIZONTAL ARROW) DD NOT ENTER WRONG WAY ONE WAY ARROW (LEFT) ONE WAY ARROW (RIGHT) ONE WAY (LEFT) ONE WAY (RIGHT) STOP HERE ON RED (45° ARROW) ROAD CLOSED XX MILES AHEAD LOCAL TRAFFIC ONLY ROAD CLOSED TO THRU TRAFFIC FINE SIGN SPEEDING/PASSING (PLATE)	
R4-1 R4-2 R4-7a R4-8a R5-1a R5-1a R6-1L R6-1R R6-2L R6-2R R10-6 R11-2 R11-2 R11-3a R11-4 CONST-3A	36×48 36×48 36×48 36×48 30×30 36×24 48×18 48×18 24×30 24×30 24×36 48×30 60×30 60×30 60×48 56×12	6.25 12.00 12.00 12.00 12.00 6.25 6.00 6.00 5.00 5.00 6.00 10.00 12.50 12.50 20.00	BK BK BK BK BK BK RD WH BK	WH WH WH WH WH RD WH	R2 R2 R2 R2 R2 R2 R2 R2 R2 R2 R2 R2 R2 R	RIGHT LANE MUST TURN RIGHT DD NOT PASS PASS WITH CARE KEEP RIGHT (HORIZONTAL ARROW) KEEP LEFT (HORIZONTAL ARROW) DD NOT ENTER WRONG WAY ONE WAY ARROW (LEFT) ONE WAY ARROW (RIGHT) ONE WAY (LEFT) ROAD CLOSED ROAD CLOSED ROAD CLOSED XX MILES AHEAD LOCAL TRAFFIC ONLY ROAD CLOSED TO THRU TRAFFIC FINE SIGN SPEEDING/PASSING (PLATE)	(3
R4-1 R4-2 R4-7a R4-8a R5-1 R5-1a R6-1L R6-1R R6-2L R6-2L R6-2L R11-3 R11-4 R11-3	36×48 36×48 36×48 30×30 36×24 48×18 48×18 24×30 24×30 24×36 48×30 60×30 60×30 60×48	6.25 12.00 12.00 12.00 6.25 6.00 6.00 5.00 6.00 10.00 12.50 20.00	BK BK BK BK BK RD WH BK BK BK BK BK BK BK BK BK	WH W	R2 R2 R2 R2 R2 R2 R2 R2 R2 R2 R2 R2 R2 R	RIGHT LANE MUST TURN RIGHT DD NOT PASS PASS WITH CARE KEEP RIGHT (HORIZONTAL ARROW) KEEP LEFT (HORIZONTAL ARROW) DD NOT ENTER WRONG WAY ONE WAY ARROW (LEFT) ONE WAY ARROW (RIGHT) ONE WAY (LEFT) ONE WAY (RIGHT) STOP HERE ON RED (45° ARROW) ROAD CLOSED XX MILES AHEAD LOCAL TRAFFIC ONLY ROAD CLOSED TO THRU TRAFFIC FINE SIGN SPEEDING/PASSING (PLATE)	

- (1) SIGN DEPICTION. ARROW. BORDERS AND SPACING SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF "STANDARD HIGHWAY SIGNS" BY THE U.S. DEPARTMENT OF TRANSPORTATION FRWA.
- (2) REFER TO THE LATEST EDITION OF MUTCD PART VI BY THE U.S. DEPARTMENT OF TRANSPORTATION FHWA FOR SIGN DEPICTION. ARROW. BORDERS AND SPACING SHALL CONFORM TO THE GUIDELINES SET FORTH IN THE LATEST EDITION OF STANDARD HIGHWAY SIGNS" BY THE U.S. DEPARTMENT OF TRANSPORTATION FHWA.
- (3) ARROW, BORDERS AND SPACING SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF "STANDARD HIGHWAY SIGNS" BY THE U.S. DEPARTMENT OF TRANSPORTATION FHWA.
- (4) USE OF A SUPPLEMENTAL PLATE FOR LINE 1 IS ACCEPTABLE.
- (5) PLAQUE AND APPLICABLE REGULATORY SIGN MAY BE MANUFACTURED AS ONE SIGN.
- (6) R2 REFER TO SEC 1042.2.7.2.
- (7) R4 REFER TO SEC 1042.2.7.3.

SIGN LAYOUTS SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF "STANDARD HIGHWAY SIGNS" BY THE U.S. DEPARTMENT OF TRANSPORTATION - FHWA, UNLESS SPECIFIED OTHERWISE.

SIGN DIMENSIONS SHOWN ARE MINIMUM. NO ADDITIONAL PAYMENT WILL BE MADE IF CONTRACTORS USE LARGER SIGNS.

NO ADDITIONAL PAYMENT WILL BE MADE FOR PLATES.

ALL PLAQUES SHALL HAVE A BORDER. PLATES SHALL NOT HAVE A BORDER.



MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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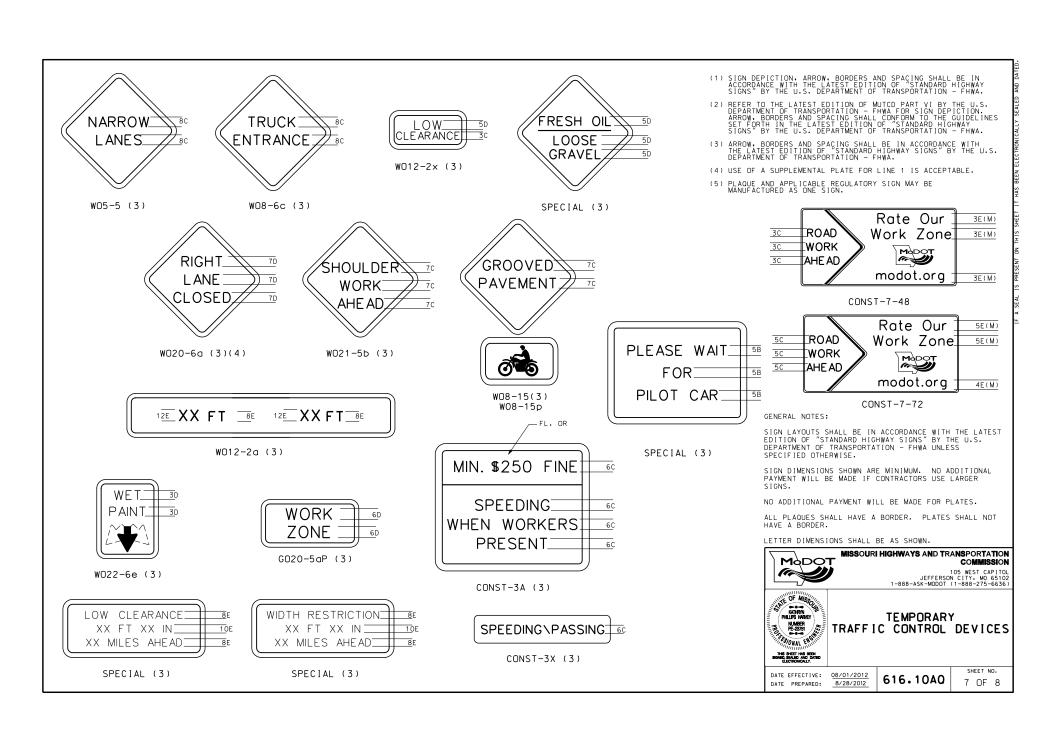
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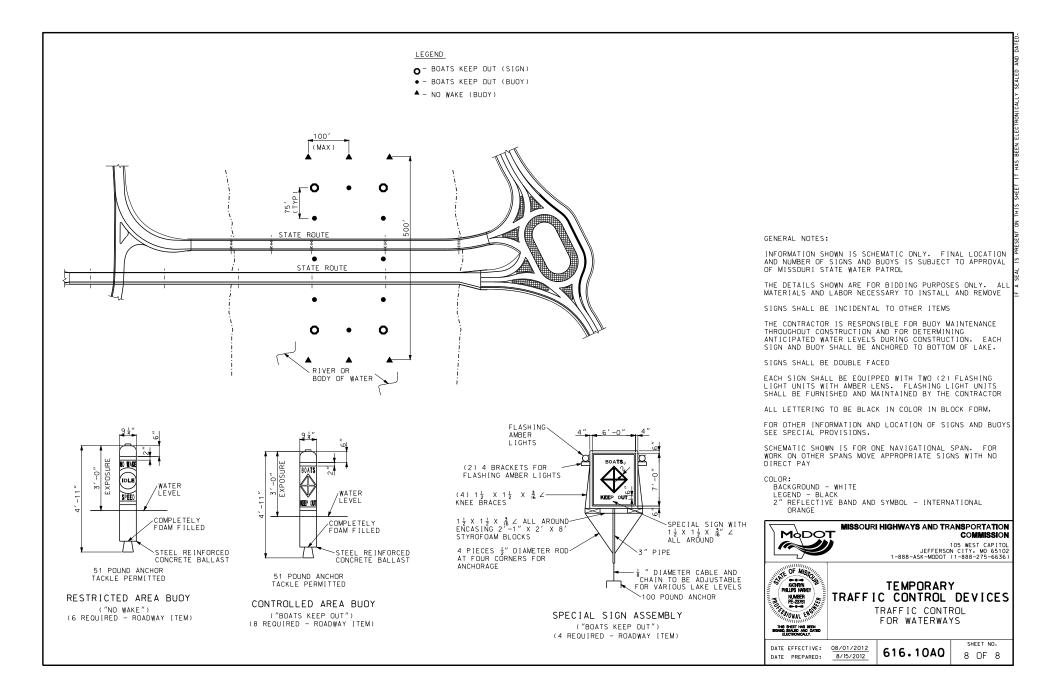
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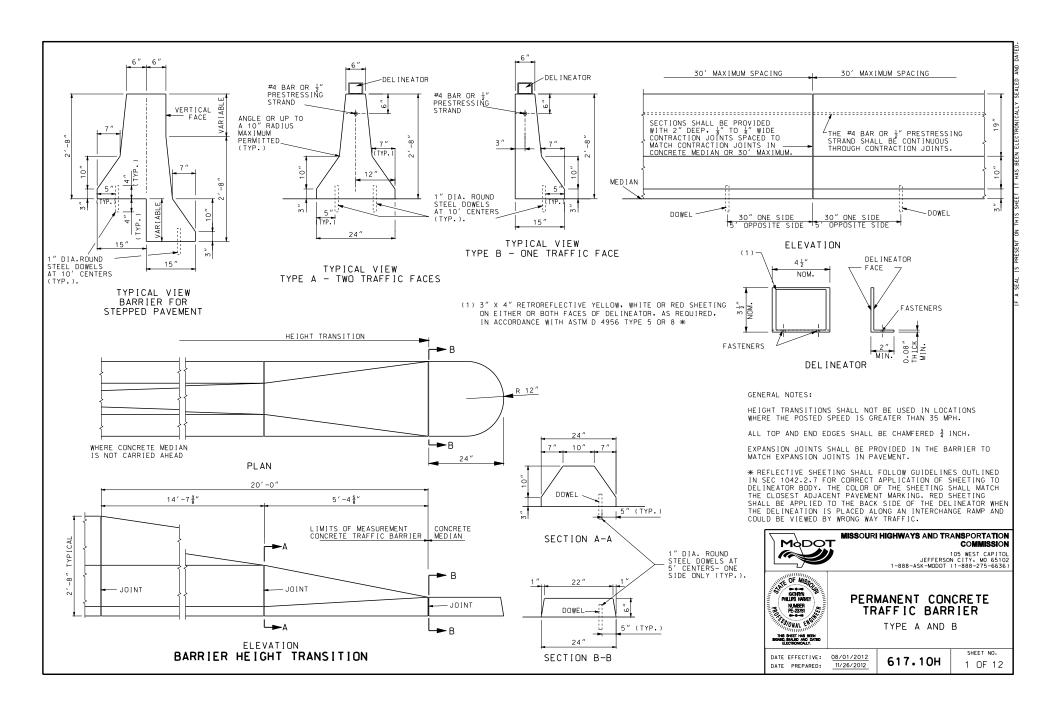
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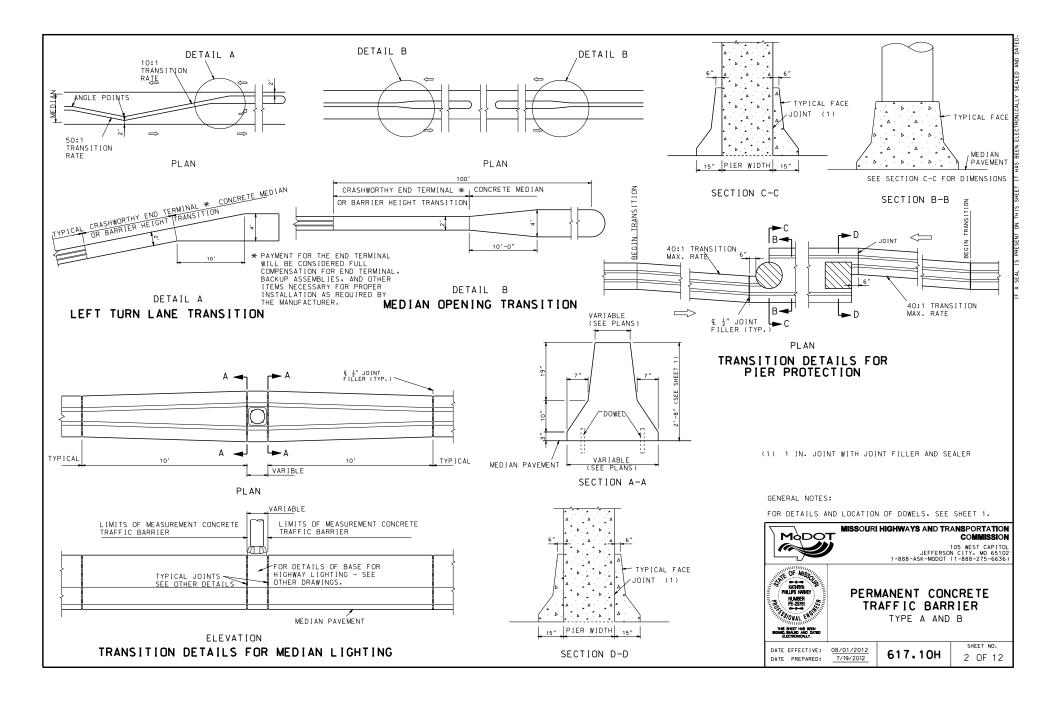
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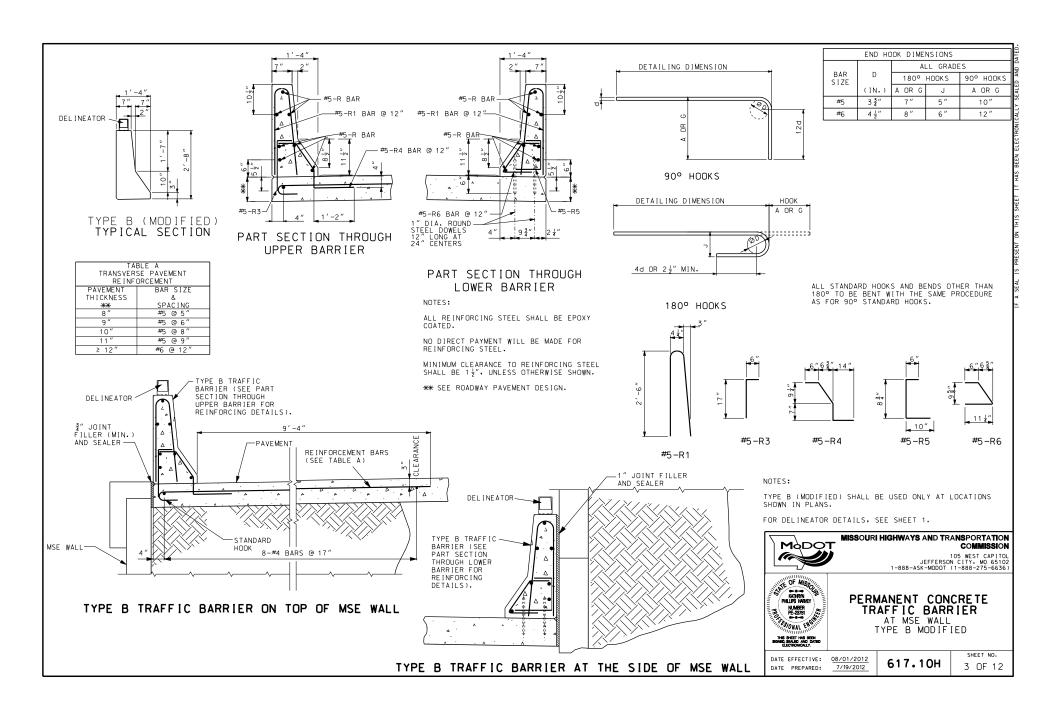
SHEET NO. 6 OF 8

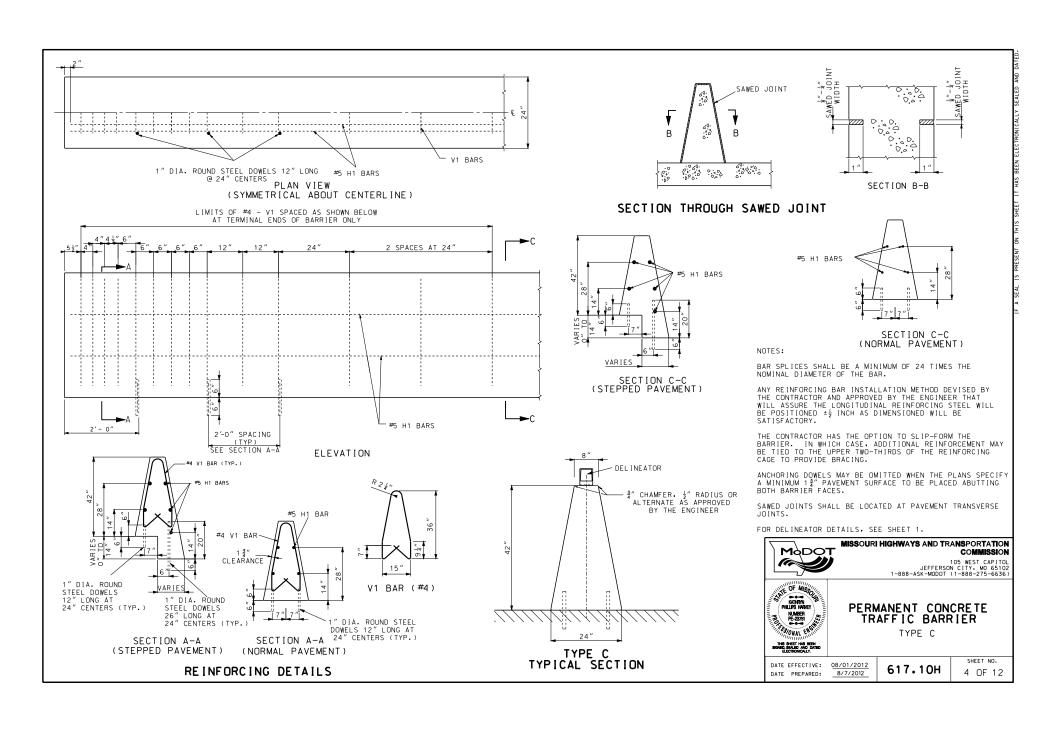


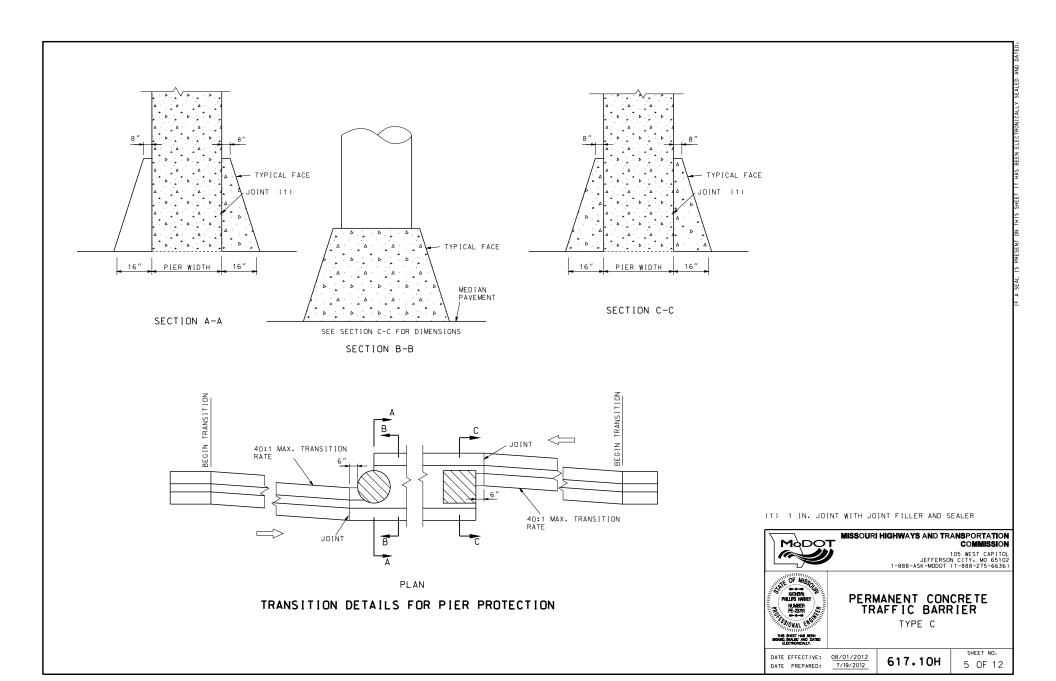


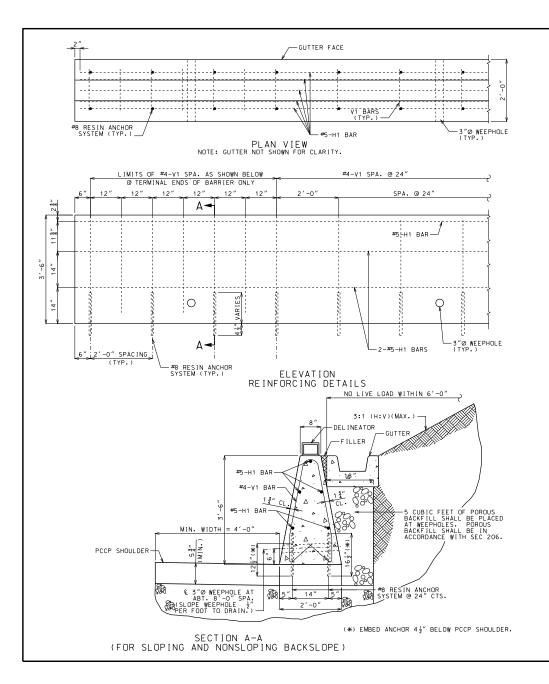


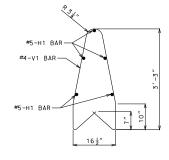












PART SECTION OF #4-V1 BAR

CONCRETE SHALL BE CLASS B F'C = 4.000 PSI.

ALL REINFORCEMENT SHALL BE GRADE 60 EPOXY COATED.

ANGLE OF INTERNAL FRICTION. ≠F ≥ 27° FOR BACKFILL MATERIAL.

MINIMUM CLEARANCE TO REINFORCING STEEL SHALL BE 1 1/2 ". UNLESS OTHERWISE SHOWN.

BAR SPLICES SHALL BE A MINIMUM OF 24 TIMES THE NOMINAL DIAMETER OR THE BAR.

ANY METHOD DEVISED BY THE CONTRACTOR AND APPROVED BY THE ENGINEER THAT WILL ASSURE THE LONGITUDINAL REINFORCING STEEL WILL BE POSITIONED \$1/2 INCH AS DIMENSIONED WILL BE SATISFACTORY.

THE CONTRACTOR HAS THE OPTION TO SLIP-FORM THE BARRIER. IN WHICH CASE. ADDITIONAL REINFORCEMENT MAY BE TIED TO THE UPPER TWO-THIRDS FO THE REINFORCING CAGE TO PROVIDE BRACING.

THIS BARRIER SHALL NOT BE USED TO SUPPORT HIGHWAY LIGHTING POLES.

THIS BARRIER SHALL NOT BE USED FOR BRIDGE ROADWAY APPLICATIONS.

SAWED JOINTS SHALL BE SPACED AT 15'-O". SEE MISSOURI STANDARD PLANS FOR SAWED JOINT DETAIL.

TYPE C BARRIER MODIFIED RETAINING WALL WITH NONMOMENT SLAB SHALL BE USED ONLY AT LOCATIONS SHOWN ON PLANS.

FOR DELINEATOR DETAILS. SEE SHEET NO. 1 OF THE MISSOURI STANDARD PLAN 617.10.

RESIN ANCHOR SYSTEM SHALL BE DRILLED IN THE PAVEMENT.

WHEN CURB HEIGHT EXCEEDS "42" OR SLOPE EXCEEDS 3:1 (H:V) OR LIVE LOAD IS WITHIN 6"-0". CONTACT BRIDGE DIVISION FOR SPECIAL DESIGN.



MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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PERMANENT CONCRETE TRAFFIC BARRIER

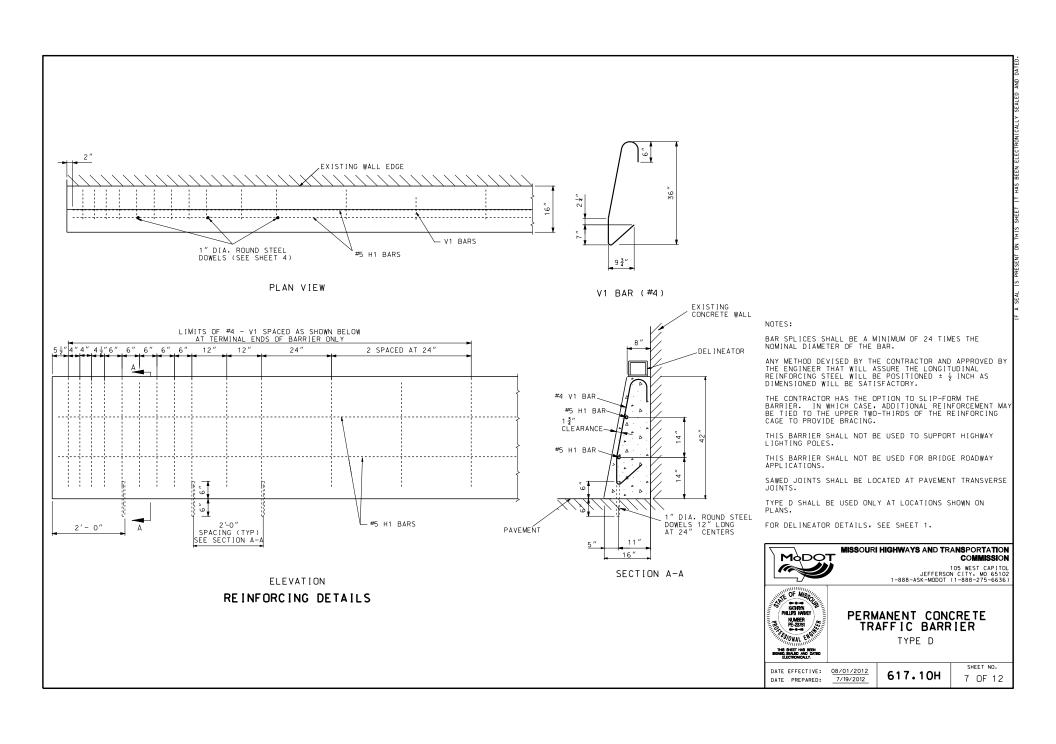
TYPE C AS RETAINING WALL

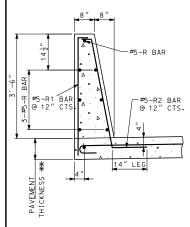
DATE EFFECTIVE: 08/0
DATE PREPARED: 7/19

7/19/2012

617.10H

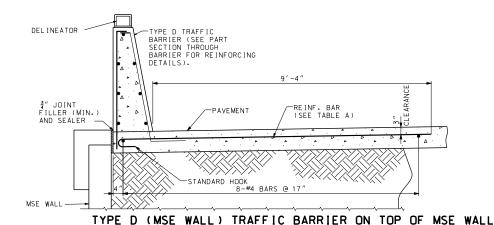
OH 6 OF 12

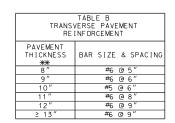


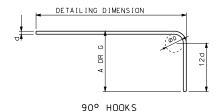


TRANSVER	BLE A SE PAVEMENT DRCEMENT
PAVEMENT THICKNESS ***	BAR SIZE & SPACING
8"	#5 @ 4"
9"	#5 @ 5"
10"	#5 @ 6"
11"	#5 @ 7"
12"	#6 @ 12"
≥ 13"	#6 @ 12"

PART SECTION THROUGH BARRIER



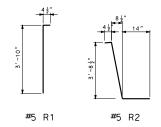




	END HOOK DIMENSIONS						
	_	ALL GRADES					
BAR SIZE	D	180°	HOOKS	90° HOOKS			
3120	(IN.)	A OR G	J	A OR G			
#5	3 3 "	7"	5 "	10"			
#6	4½" 8" 6" 12"						

DETAILING DIMENSION A OR G (ØD) 4d OR 2 1 MIN. 180° HOOKS

ALL STANDARD HOOKS AND BENDS OTHER THAN 180° TO BE BENT WITH THE SAME PROCEDURE AS FOR 90° STANDARD HOOKS.



NOTES:

MINIMUM CLEARANCE TO REINFORCING STEEL SHALL BE 11", UNLESS OTHERWISE SHOWN.

** SEE ROADWAY PAVEMENT DESIGN.

TYPE D SHALL BE USED ONLY AT LOCATIONS SHOWN ON PLANS.

FOR DELINEATOR DETAILS, SEE SHEET 1.



MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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PERMANENT CONCRETE TRAFFIC BARRIER

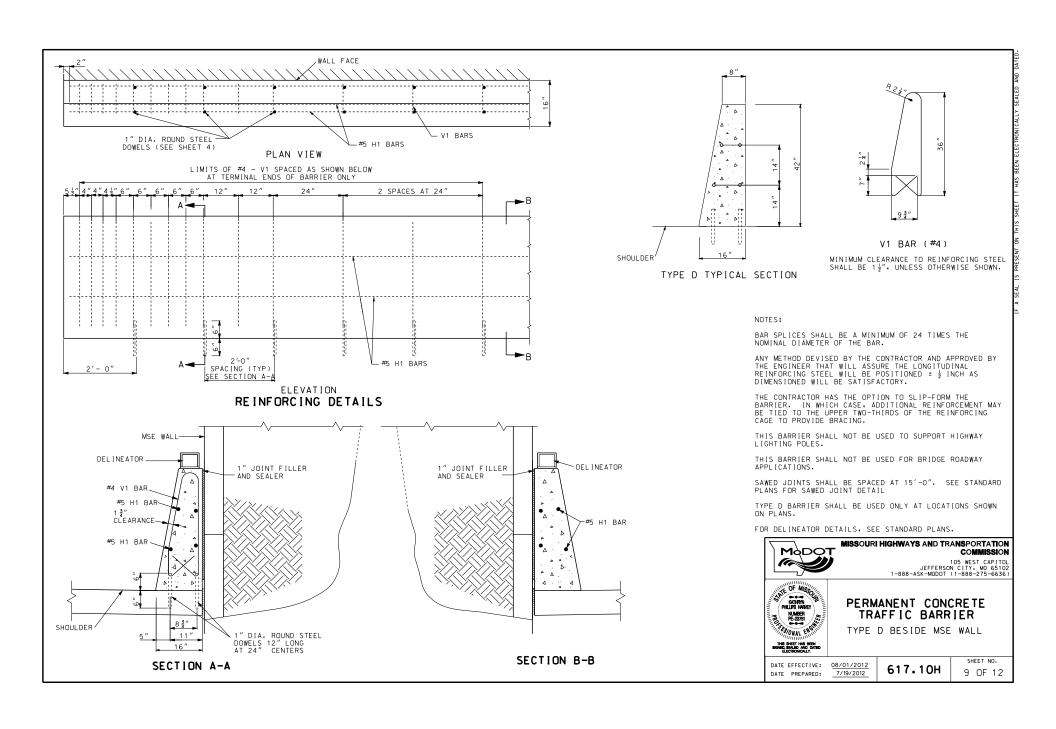
TYPE D ATOP MSE WALL

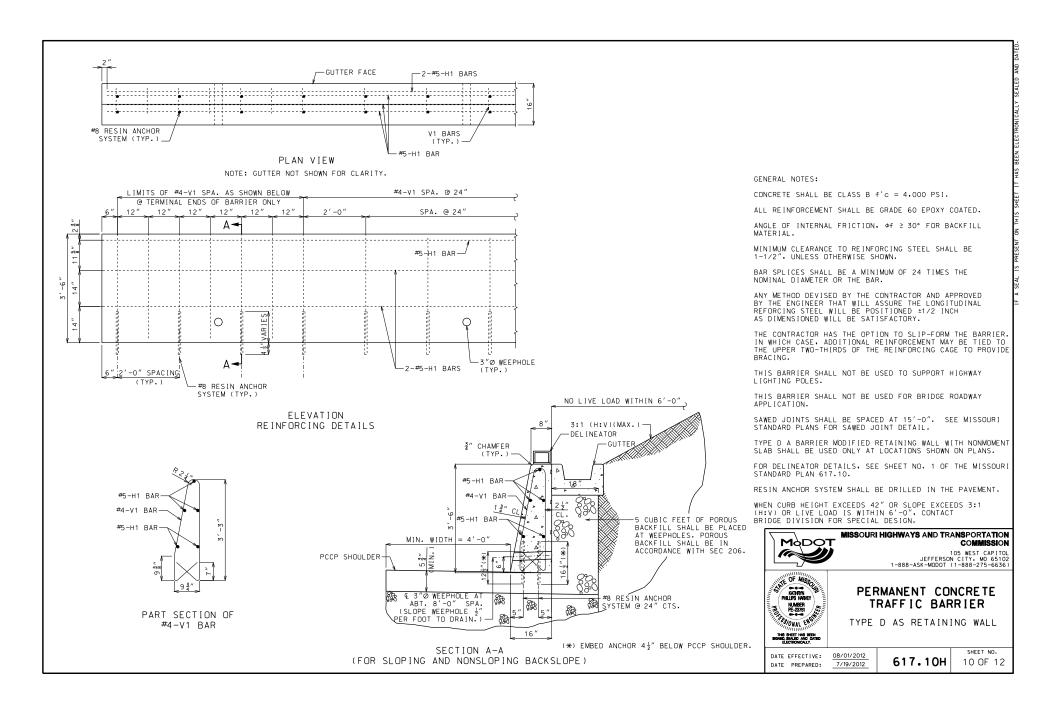
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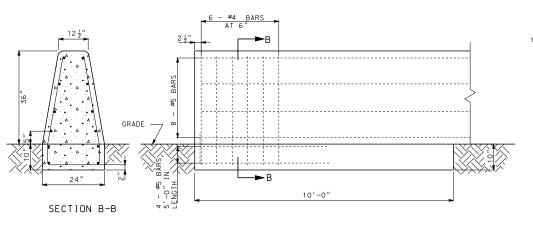
THE SHEET HAS BEEN SIGNED SEALED AND DATED ELECTRONICALLY

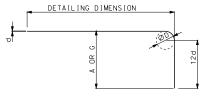
617.10H

SHEET NO. 8 OF 12



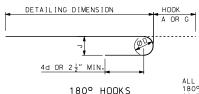






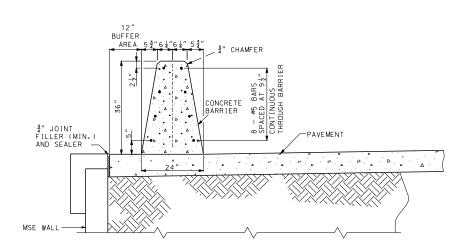
END HOOK DIMENSIONS						
0.10	_	ALL GRADES				
BAR SIZE	D	180°	HOOKS	90° HOOKS		
3122	(IN.)	A OR G	J	A OR G		
#5	3 3 "	7 "	5 "	10"		
#6	4 ½"	8 "	6"	12"		

90° HOOKS

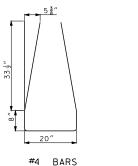


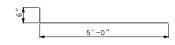
ALL STANDARD HOOKS AND BENDS OTHER THAN 180° TO BE BENT WITH THE SAME PROCEDURE AS FOR 90° STANDARD HOOKS.

CONCRETE BARRIER END ANCHORAGE ON GRADE



TRAFFIC BARRIER ON TOP OF MSE WALL





#5 BARS

GENERAL NOTES:

MINIMUM CLEARANCE TO REINFORCING STEEL SHALL BE 1 $\frac{1}{2}''$, UNLESS OTHERWISE SHOWN.

A 12" BUFFER REQUIRED WITHIN THE LIMITS OF THE TRAFFIC BARRIER EXCLUDING THE END ANCHORAGE SECTIONS.

FOR DELINEATOR DETAILS. SEE STANDARD PLAN 617.10.

PAVEMENT SURFACE DIFFERENTIAL SHALL NOT EXCEED 1 $\frac{1}{2}^{\prime\prime}$.

BAR SPLICES SHALL BE A MINIMUM OF 24 TIMES THE NOMINAL DIAMETER OF THE BAR.





PERMANENT CONCRETE TRAFFIC BARRIER

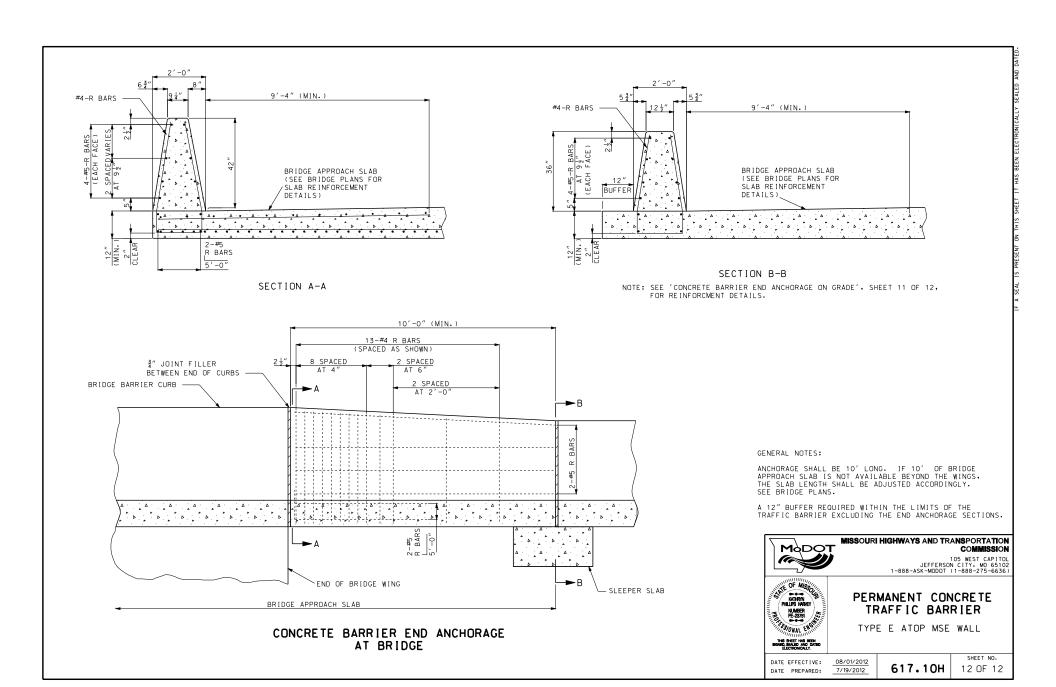
TYPE E ATOP MSE WALL

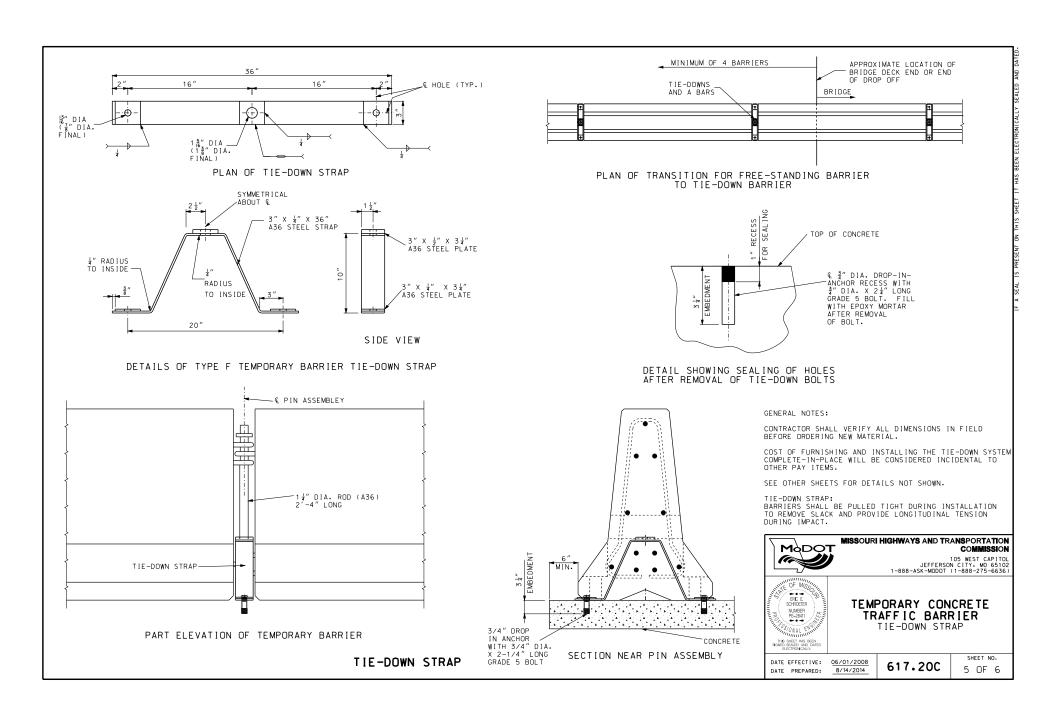
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DATE PREPARED: 3

7/19/2012

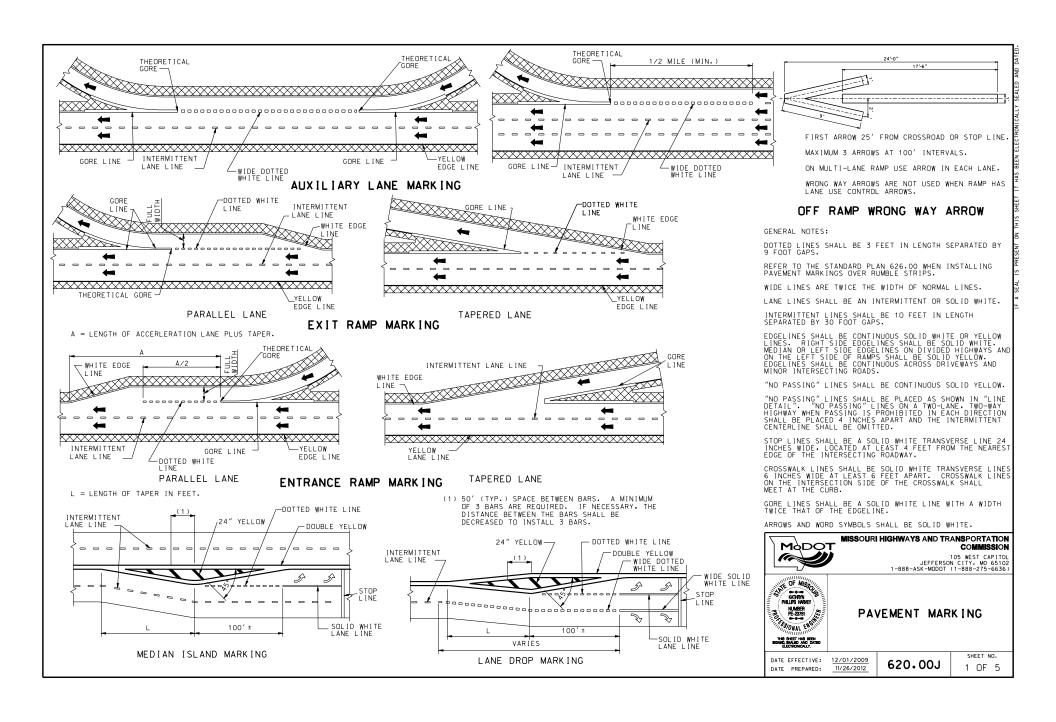
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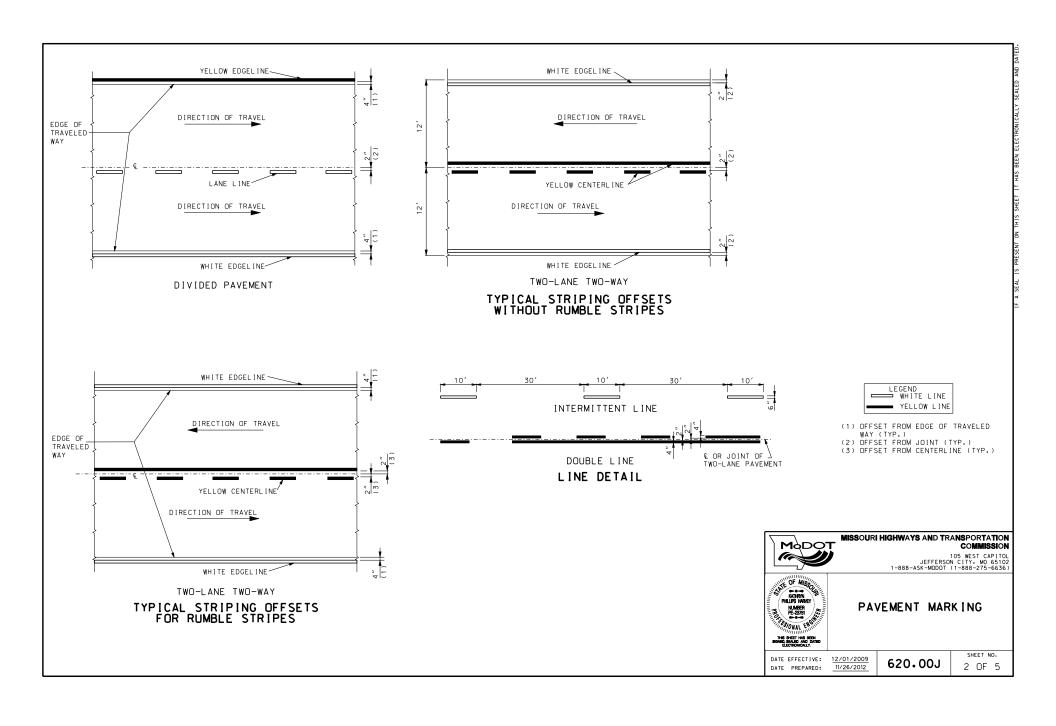
SHEET NO. 11 OF 12

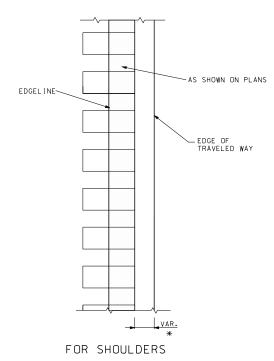


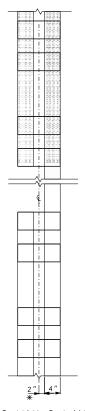


	COND	ITION	TOFATMENT	SI	GN	
CROSS SECTION	DIFFERENTIAL	TIME	TREATMENT	MAINLINE (2)	SIDE ROAD (3)	(1) SIGNS SHALL BE VISIBLE TO TRAFFIC ONLY WHEN AND
1V:1H SLOPE OR FLATTER ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~	PAVEMENT EDGE DIFFERENTIAL > 2" TO ≤ 3"	NON-WORKING HOURS	WEDGE SLOPE TO 1V:1H OR FLATTER		NO SIGNS	WHERE CONDITIONS EXIST. (2) SIGNS SHALL BE SPACED AT APPROXIMATELY ONE MILE OF STATE ROADS. WHEN A SIGN PLACED AT THE ONE MILE OF A SIGN PLACED AFTER AN INTERSECTION. THE SIGN PLACED
		WORKING HOURS	NO EDGE TREATMENT REQUIRED	SHOULDER DROP-OFF WO8-17 (4)(5) WO8-17p (8)	REQUIRED	AT THE 1/2 MILE INTERVAL MAY BE OMITTED. WHEN LOW SHOULDER/SHOULDER DROP-OFF SIGNS WITH UNEVEN LAMES ARE BOTH SPECIFIED. ALTERNATING SIGN MESSAGES SHALL BE USED AT 1 MILE SPACINGS. 13 ON SIDE ROADS WITH POSTED SPEED OF 45 MPH OR
1V:1H SLOPE OR FLATTER —	PAVEMENT EDGE DIFFERENTIAL	NON-WORKING HOURS	WEDGE SLOPE TO 1V:1H OR FLATTER		NO SIGNS REQUIRED	GREATER. SIGNS SHALL BE PLACED 150 FT. IN ADVANCE OF INTERSECTION WITH MAINLINE. (4) SIGNS SHALL BE LOCATED ON THE SIDE OF THE ROADWAY WHERE THE PAVEMENT EDGE DIFFERENTIAL EXISTS. ON TWO-LANE UNDIVIDED HIGHWAYS. BACK-TO-BACK SIGNS
Christian Christ	> 2″ TO ≤ 3″	WORKING HOURS	NO EDGE TREATMENT REQUIRED	SHOULDER DROP-OFF WO8-17 (4)(5) WO8-17p (8)	REGUINED	SHALL BE PROVIDED ON THE SIDE OF THE ROADWAY, WHERE THE PAVEMENT EDGE DIFFERENTIAL EXISTS. "BACK TO BACK" SIGNS SHALL BE SEPARATED BY 7-10 FEET.
1V:3H SLOPE OR FLATTER —	PAVEMENT EDGE DIFFERENTIAL	NON-WORKING HOURS	WEDGE SLOPE TO 1V:3H OR FLATTER		BUMP	(5) SIGNS TO REMAIN VISIBLE UNTIL SHOULDER SHAPING IS COMPLETE. (6) SIGNS SHALL BE LOCATED ON RIGHT SIDE OF NON-DIVIDED HIGHWAYS AND ON BOTH SIDES OF DIVIDED HIGHWAYS WHERE A LANE LINE DIFFERENTIAL EXISTS.
	> 3"	WORKING HOURS	DELINEATE DIFFERENTIAL WITH CHANNELIZERS	SHOULDER DROP-OFF WO8-17 (4)(5) WO8-17p (8)	W08-1 (4)	(7) FOR ADDITIONAL SIGN SPACING AND DETAILS SEE STD PLAN 620.10. (8) WHEN THE SHOULDER DROP-OFF SIGNS ARE IN PLACE
LANE LINE	LANE LINE DIFFERENTIAL ≤ 2"	NON-WORKING AND WORKING HOURS	NO EDGE TREATMENT REQUIRED	UNE VEN LANES	NO SIGNS REQUIRED	FOR GREATER THAN THREE DAYS, THE SHOULDER DROP-OFF PLAQUE SHOULD BE USED IN ADDITION WITH THE SHOULDER DROP-OFF SIGN.
1V:3H SLOPE OR FLATTER	LANE LINE	NON-WORKING AND WORKING HOURS WHERE LANES OPEN TO TRAFFIC	WEDGE SLOPE TO 1V:3H OR FLATTER	UNE VEN L ANES	BUMP	LEGEND THE RIGID PAVEMENT THE PAVEMENT
(1)	DIFFERENTIAL > 2"	NON-WORKING AND WORKING HOURS WHERE LANE CLOSED TO TRAFFIC	DELINEATE DIFFERENTIAL WITH CHANNELIZERS	W08-11 (6)	W08-1	ALL PAVEMENT TYPES
ALL ALL HEIGHTS	ANY PAVEMENT EDGE OR LANE LINE DIFFERENTIAL	NON-WORKING AND WORKING HOURS WHERE PLANS REQUIRE ADJACENT LANE CLOSURE WITH CHANNELIZATION OR PARTIAL LANE CLOSURE WITH BARRIER.	NO EDGE TREATMENT REQUIRED	NO SIGNS REQUIRED	NO SIGNS REQUIRED	MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION JEFFERSON CITY. MO 65102 1-888-ASK-MODOT (1-888-275-6636)
						PAVEMENT EDGE TREATMENT PAUS HARD NAME OF THE PARENT SHEET NO. DATE EFFECTIVE: 05/01/2012 DATE PREPARED: 3/28/2012 DATE PREPARED: 3/28/2012 AND SHEET NO. 1 OF 1









2 WAY 2 LANE (SEE TYPICAL STRIPING FOR RUMBLESTRIPS)



MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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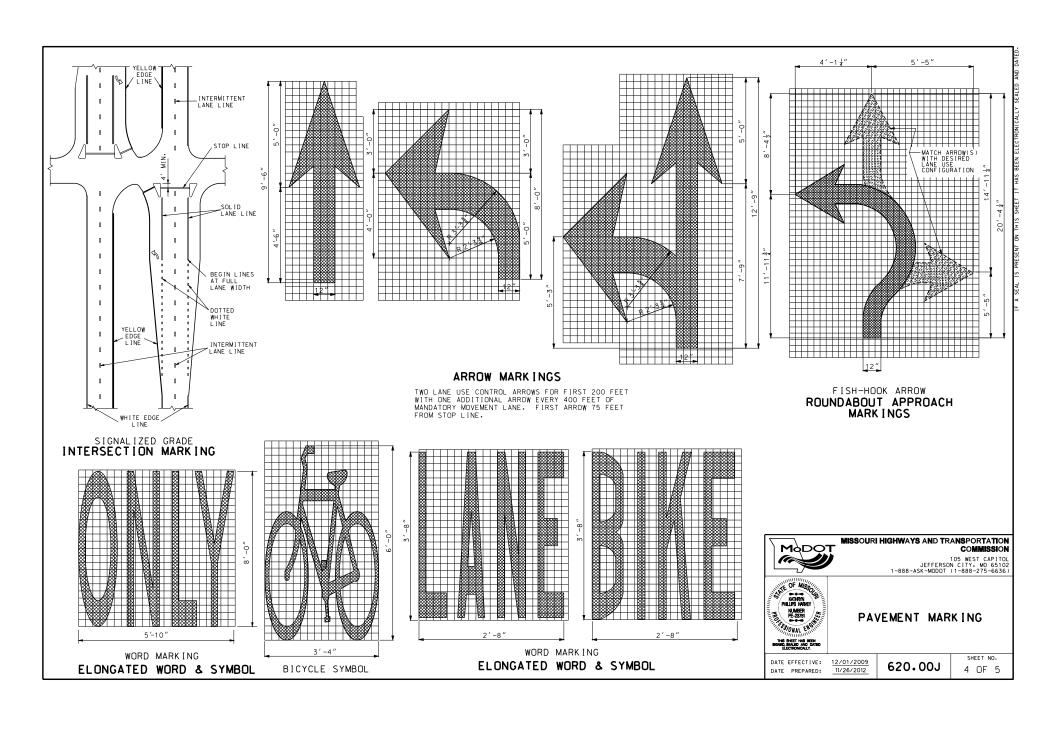
PAVEMENT MARKING STRIPING THROUGH

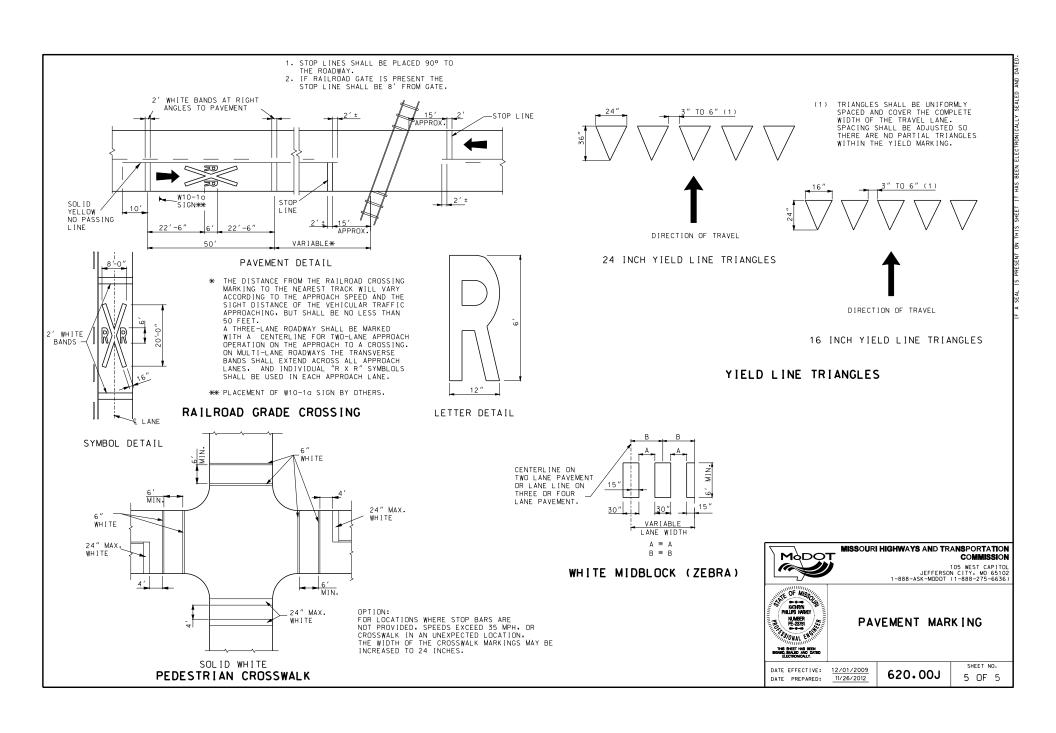
RUMBLE STRIPS

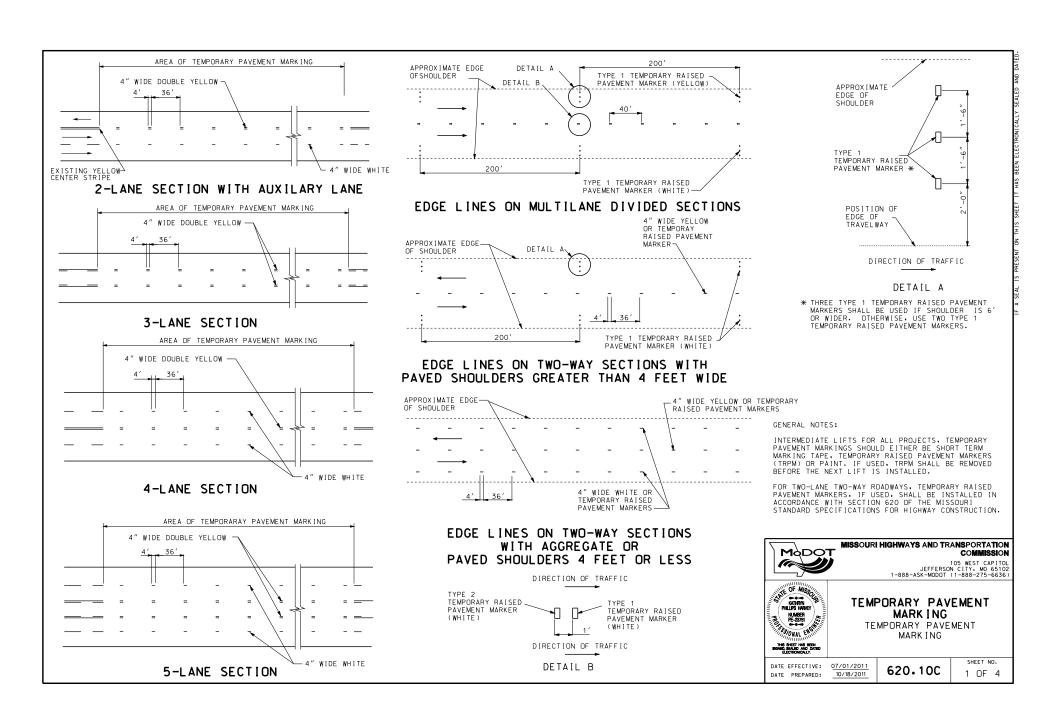
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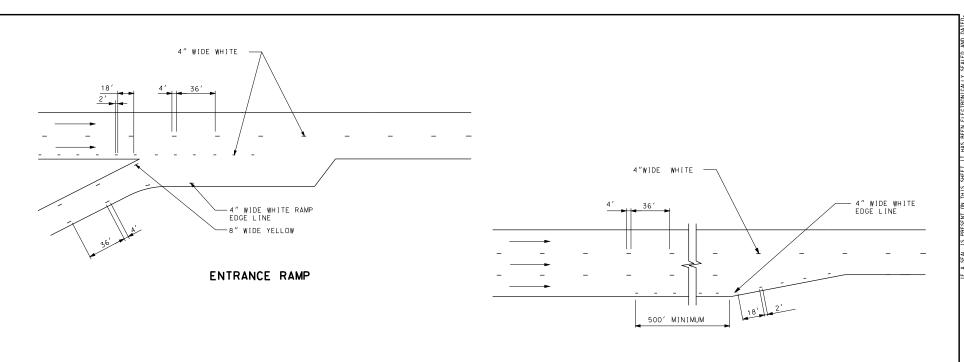
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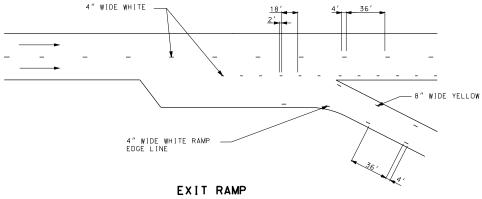
SHEET NO. 3 OF 5









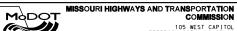


LANE TRANSITION

GENERAL NOTES:

TEMPORARY PAVEMENT MARKING IN INTERSECTIONS. RAMPS GORES AND OTHER TRANSITION AREAS USE AN INTERMITTENT MARKING OF 2 FEET LONG AT A CYCLE OF 20 FEET.

LIMITS OF TEPORARY GORE MARKING ARE THE SAME AS THE EXISTING GORE LINES.



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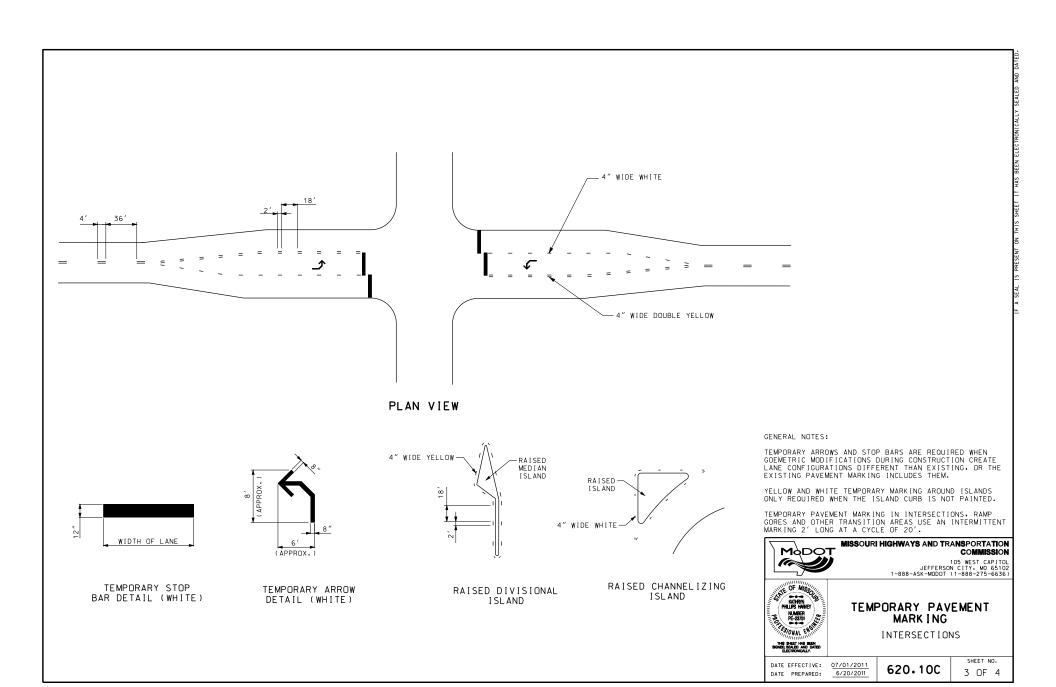
TEMPORARY PAVEMENT MARK ING

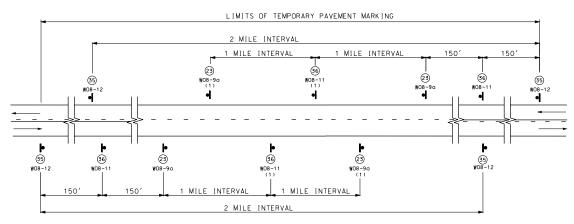
LANE TRANSITION AND RAMP AREAS

DATE EFFECTIVE: 07/01/2011 DATE PREPARED: 6/20/2011

620.10C

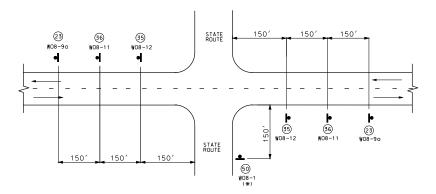
SHEET NO. 2 OF 4





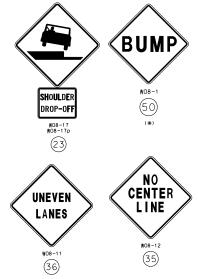
SIGN SPACING FOR MAINLINE

(DETAIL SHOWN IS BASED ON A PROJECT MEETING ALL CONDITIONS: NO CENTER STRIPE, UNEVEN LANES, SHOULDER DROP OFF AND BUMP.) (1) IF ONLY ONE CONDITION EXISTS (UNEVEN LANES OR SHOULDER DROP OFF). THE SIGN SPACING SHALL BE AT 1 MILE INTERVALS.



SIGN SPACING AT STATE ROUTE INTERSECTIONS

(*) BUMP SIGN SHOULD BE IN ACCORDANCE WITH STANDARD PLAN 619.10.



GENERAL NOTES:

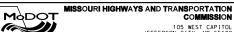
FOR DETAILS OF TEMPORARY PAVEMENT MARKING SEE STANDARD PLAN 620.10.

SIGN (3) AND TEMPORARY PAVEMENT MARKING INSTALLED WHERE CENTERLINE STRIPING HAS BEEN COVERED OR REMOVED. SIGNS ARE TO REMAIN IN PLACE UNTIL THE PERMANENT CENTERLINE PAVEMENT MARKINGS ARE IN PLACE. SIGNS SHALL BE COVERED OR REMOVED WHEN PAVEMENT CENTERLINE MARKING HAS BEEN INSTALLED.

SIGN (35) IS PLACED AT APPROXIMATELY TWO-MILE INTERVALS AND AT STATE ROUTE JUNCTIONS. WHEN THE INSTALLATION AT A JUNCTION IS WITHIN ONE-EIGHTH MILE OF THE NORMAL MAINLINE SIGN (35) . THE LATTER MAY BE ELIMINATED.

ALL SIGNS SHALL BE POST MOUNTED AND IN ACCORDANCE WITH STANDARD PLAN 616.10 AND 903.03.

WHEN SHOULDER DROP-OFF SIGNS ARE IN PLACE FOR GREATER THAN THREE DAYS. THE SHOULDER DROP-OFF PLAQUE SHOULD BE USED IN ADDITION WITH THE SHOULDER DROP-OFF SIGN.



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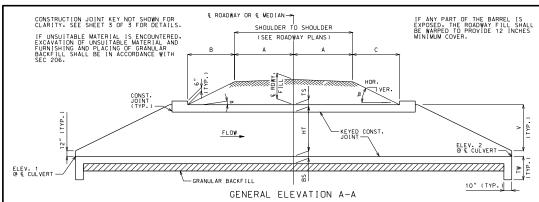
TEMPORARY PAVEMENT MARK ING

TWO-LANE TWO-WAY HIGHWAY

DATE EFFECTIVE: 07/01/2011 DATE PREPARED:

620.10C

SHEET NO. 4 OF 4



CHANNEL BOTTOM SHALL BE GRADED WITHIN RIGHT OF WAY FOR TRANSITION OF CHANNEL BED TO CULVERT OPENINGS. CHANNEL BANKS SHALL BE TAPERED TO MATCH CULVERT OPENINGS.

BARREL LENGTH GRANULAR BACKFILL LIMITS FLOW 10" © CULVERT -TIE STATION 5″ 101 CONST. JOINT (TYP.) GRANULAR BACKFILL LIMITS 3″ € ROADWAY OR € MEDIAN-W = TOTAL LENGTH NORMAL TO € ROADWAY OR € MEDIAN PLAN OF LAYOUT DIMENSIONS

(g) AHEAD STATION WHERE STREAM FLOWS LEFT TO RIGHT. (b) AHEAD STATION WHERE STREAM FLOWS RIGHT TO LEFT.

EQUATIONS FOR COMPUTING \propto , β , B AND C

- ≃ = ANGLE OF BARREL SLOPE WITH HORIZONTAL NORMAL TO € ROADWAY OR € MEDIAN = ARCTAN (ELEV. 1 ELEV. 2)
- β = ANGLE OF FILL SLOPE WITH HORIZONTAL NORMAL TO € ROADWAY OR € MEDIAN = ARCTAN (VER.\(\frac{1}{400 \text{R}}\).
- B = HORIZONTAL DISTANCE FROM UPSTREAM EDGE OF SHOULDER TO = € RDWY. FILL + A(CS) A(TAN∝)
 UPSTREAM HEADWALL NORMAL TO € ROADWAY OR € MEDIAN

 TANβ + TANα
- C = HORIZONTAL DISTANCE FROM DOWNSTREAM EDGE OF SHOULDER TO = $\frac{C}{C}$ RDWY. FILL + A(CS) + A(TAN \propto) DOWNSTREAM HEADWALL NORMAL TO $\frac{C}{C}$ ROADWAY OR $\frac{C}{C}$ MEDIAN TAN $\frac{C}{C}$ TAN $\frac{C}{C}$
- CROSS SLOPE OF EACH PART OF ROADWAY INCLUDING CROWN, LANES AND SHOULDERS. CS IS POSITIVE IF RISING AND NEGATIVE IF FALLING AWAY FROM & ROADWAY OR & MEDIAN.

THE TERM "ALCS)" IS THE DIFFERENCE IN ELEVATION BETWEEN & ROADWAY OR & MEDIAN AND THE TOP OF THE FILL SLOPE NORMAL TO & ROADWAY OR & MEDIAN. THIS TERM SHALL BE ADJUSTED FOR UNSYMMETRICAL AND NONSTANDARD ROADWAYS. TO ACCOUNT FOR A VARYING PROFILE GRADE THE € ROADWAY FILL SHALL BE BASED ON STATIONS THAT CORRESPOND TO THE CORNERS OF THE INSIDE FACE OF THE HEADWALLS THAT PRODUCE MAXIMUM VALUES FOR B AND C.

SEE ROADWAY PLANS FOR SLOPES, & ROADWAY FILL AND ELEVATIONS 1 AND 2. ELEVATIONS 1 AND 2 CORRESPOND TO UPPER AND LOWER FLOW LINE ELEVATIONS AND MAY BE BELOW THE NATURAL STREAM BOTTOM DUE TO ENVIRONMENTAL REQUIREMENTS.

LAYOUT DIMENSIONS								
/ARIABLE	I ABLE DIMENSION							
×	SEE EQUATIONS							
β	SEE EQUATIONS							
В	SEE EQUATIONS							
С	SEE EQUATIONS							
E	G + 23"							
F	S + 2TX							
G	G 2V							
V HT + TS - 12"								
W	W 2A + B + C + 2E							
ΤŴ	MAX{3'-4" OR (BS + 12")}							

GENERAL NOTES:

DESIGN SPECIFICATIONS: 2010 AASHTO LRFD BRIDGE DESIGN SPECFICATIONS AND 2010 INTERIM REVISIONS

DESIGN LOADING:
VEHICULAR = HL-93 MINUS LANE LOAD. EARTH = 120 LB/CF
EQUIVALENT FLUID PRESSURE = 30 LB/CF (MIN.). 60 LB/CF (MAX.)

DESIGN UNIT STRESSES: CLASS B-1 CONCRETE (BOX CULVERT) f'c = 4.000 PSI REINFORCING STEEL (GRADE 60) fy = 60.000 PSI

MISCELLANEOUS: FOR REINFORCEMENT DETAILS. SEE SHEET 2 OF 3. FOR SECTION DETAILS. SEE SHEET 3 OF 3. FOR MEMBER THICKNESS. SEE 703.17.

DRAWING NOT TO SCALE. FOLLOW DIMENSIONS.

DIMENSIONS ARE IN INCHES UNLESS OTHERWISE NOTED.

WHEN ALTERNATE PRECAST CONCRETE BOX CULYERT SECTIONS ARE USED. THE MINIMUM DISTANCE FROM INSIDE FACE OF HEADWALLS TO PRECAST SECTIONS MEASURED ALONG THE SHORTEST WALL SHALL BE 3 FEET. REINFORCEMENT AND DIMENSIONS FOR WINDS AND HEADWALLS SHALL BE IN ACCORDANCE WITH MISSOURI STANDARD PLANS.



MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

105 WEST CAPITOL JEFFERSON CITY, MO 65102



CONCRETE SINGLE BOX CULVERT

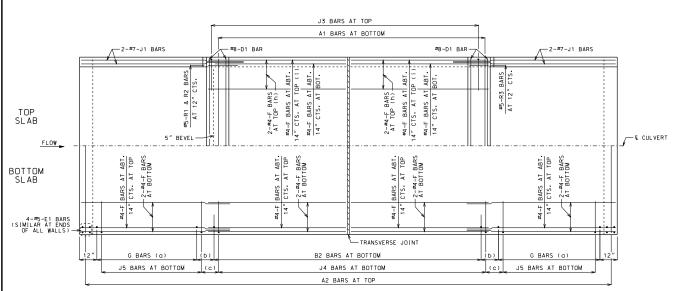
SKEW: SQUARED WINGS: STRAIGHT

LAYOUT

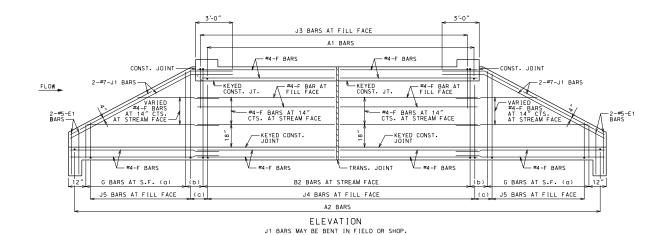
DATE EFFECTIVE: 07/01/2015 DATE PREPARED:

703.10J

SHEET NO. 1 OF 3



HALF PLANS HALF PLANS ARE SYMMETRICAL ABOUT & CULVERT.



LAYING OUT TRANVERSE JOINTS UNLESS SHOWN ON ROADWAY OR BRIDGE PLANS

USE A TRANSVERSE JOINT WHEN BARREL LENGTH IS OVER 80 FEET. USE ADDITIONAL JOINTS TO LIMIT CUT SECTION LENGTH AND END SECTION BARREL LENGTH MEASURED ALONG CHETRLING OF CULVENT TO 50 FEET.

MINIMUM END SECTION LENGTH SHALL BE 3 FEET MEASURED ALONG THE SHORTEST WALL FROM THE INSIDE FACE OF HEADWALL TO THE TRANSVERSE JOINT.

TO AVOID LOCATING TRANSVERSE JOINTS UNDER A TRAVELED WAY WITH DESIGN FILLS 2 FEET OR LESS THE FOLLOWING SHALL APPLY:

BARREL LENGTH UP TO 90 FEET WITHOUT A TRANSVERSE JOINT

CUT SECTION LENGTHS UP TO 60 FEET

WHEN BARREL AND CUT SECTION LENGTH RESTRICTIONS REQUIRE TRANSVERSE JOINTS TO BE LOCATED UNDER A TRAVELED WAY WITH DESIGN FILLS 2 FEET OR LESS. THE JOINTS SHALL BE LOCATED TO MINIMIZE THE LENGTH OF JOINT UNDER THE TRAVELED WAY.

TRAVELED WAY IS THE ROADWAY WIDTH MINUS SHOULDER WIDTHS.

FOR CUT SECTION DETAILS. SEE 703.16.

GENERAL NOTES:

FOR SECTIONS THRU BARREL, WINGS AND HEADWALLS, SEE SHEET 3 OF 3. FOR BAR SIZES, SPACING AND DIMENSIONS OF ALL REINFORCEMENT EXCEPT JS BARS, SEE 703.17. FOR JS BARS, SEE 703.37.

CONSTRUCTION JOINT KEY NOT SHOWN FOR CLARITY IN HALF PLANS AND ELEVATION. SEE SHEET 3 OF 3 FOR DETAILS.

DRAWING NOT TO SCALE. FOLLOW DIMENSIONS.

MINIMUM CLEARANCE TO REINFORCING STEEL SHALL BE $1\frac{1}{2}"$.

LAP LONGITUDINAL BARS A MINIMUM OF 23" AT SPLICES.

BEVELED HEADWALL SHALL BE LOCATED AT UPSTREAM END.

(a) SAME SIZE AND SPACING AS B2 BARS

(b) VARIES. 12" MAXIMUM

(c) J4 BAR SPACING

(d) NOT SPECIFIED ON THIS SHEET

(e) NOT SPECIFIED ON THIS SHEET

(f) NOT SPECIFIED ON THIS SHEET

(g) NOT SPECIFIED ON THIS SHEET

(h) FOR DESIGN FILLS OVER 2'-0"

(i) FOR DESIGN FILLS 2'-0" OR LESS



MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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CONCRETE SINGLE BOX CULVERT

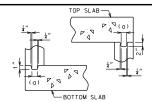
SKEW: SQUARED WINGS: STRAIGHT

REINFORCEMENT

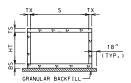
DATE EFFECTIVE: 07/01/2015 DATE PREPARED:

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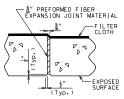
SHEET NO. 2 OF 3



KEYED CONSTRUCTION JOINT (a) APPROXIMATELY ONE-THIRD OF WALL

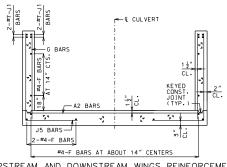


GRANULAR BACKFILL LIMITS AND MEMBER DIMENSIONS

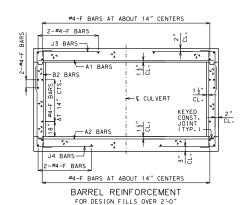


TRANSVERSE JOINT THRU BARREL PREFORMED FIBER EXPANSION JOINT MATERIAL IN ACCORDANCE WITH SEC 1057 SHALL BE SECURELY STITCHED TO ONE FACE OF THE CONCRETE WITH 10 GAGE COPPER WIRE OR 12 GAGE SOFT DRAWN GALVANIZED STEEL WIRE.

FILTER CLOTH 3 FEET IN WIDTH AND DOUBLE
THICKNESS SHALL BE CENTERED ON TRANSVERSE JOINTS
IN TOP SLAB AND SIDEWALLS WITH EOGES SEALED WITH
MASTIC OR TWO SIDED TAPE. FILTER CLOTH SHALL BE
A SUBSURFACE DRAINAGE GEOTEXTILE IN ACCORDANCE
WITH SEC 1011. COST OF FURNISHING AND INSTALLING
FILTER CLOTH WILL BE CONSIDERED COMPLETELY
COVERED BY THE CONTRACT UNIT PRICE FOR OTHER
ITEMS.



UPSTREAM AND DOWNSTREAM WINGS REINFORCEMENT

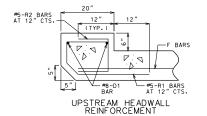


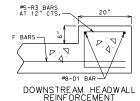
J3 BARS 7,9 - € CULVERT CL KEYED CONST. JOINT (TYP.) J4 BARS-2-#4-F BARS #4-F BARS AT ABOUT 14" CENTERS

#4-F BARS AT ABOUT 14 CENTERS

#4-F BARS AT ABOUT 14" CENTERS

BARREL REINFORCEMENT FOR DESIGN FILLS 2'-0" OR LESS





GENERAL NOTES:

FOR MEMBER THICKNESS AND FOR BAR SIZES, SPACING AND DIMENSIONS OF ALL REINFORCEMENT EXCEPT J5 BARS, SEE 703.17. FOR J5 BARS, SEE 703.37.

BARREL AND WINGS SECTIONS ARE SYMMETRICAL ABOUT AND NORMAL TO © CULVERT. HEADWALL SECTIONS ARE NORMAL TO LONG DIRECTION OF HEADWALL.

DRAWING NOT TO SCALE. FOLLOW DIMENSIONS.

MINIMUM CLEARANCE TO REINFORCING STEEL SHALL BE $1\frac{1}{2}$.



MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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CONCRETE SINGLE BOX CULVERT

> SKEW: SQUARED WINGS: STRAIGHT

> > SECTIONS

DATE EFFECTIVE: DATE PREPARED:

07/01/2015

703.10J



BARREL LENGTH GRANULAR BACKFILL LIMITS FLOW © CULVERT -- TIE STATION 10' 10" DETAIL A GRANULAR BACKFILL LIMITS 3″ € ROADWAY OR € MEDIAN -W = TOTAL LENGTH NORMAL TO € ROADWAY OR € MEDIAN PLAN OF LAYOUT DIMENSIONS (g) AHEAD STATION WHERE STREAM FLOWS LEFT TO RIGHT. (b) AHEAD STATION WHERE STREAM FLOWS RIGHT TO LEFT.

EQUATIONS FOR COMPUTING \propto , β , B AND C

- ≃ = ANGLE OF BARREL SLOPE WITH HORIZONTAL NORMAL TO € ROADWAY OR € MEDIAN = ARCTAN (ELEV. 1 ELEV. 2)
- β = ANGLE OF FILL SLOPE WITH HORIZONTAL NORMAL TO & ROADWAY OR & MEDIAN = ARCTAN (VER. HOR.
- : HORIZONTAL DISTANCE FROM UPSTREAM EDGE OF SHOULDER TO = <u>€ RDWY. FILL + A(CS) A(TAN∝)</u>
 UPSTREAM HEADWALL NORMAL TO € ROADWAY OR € MEDIAN

 TANB + TAN∞
- C = HORIZONTAL DISTANCE FROM DOWNSTREAM EDGE OF SHOULDER TO = $\frac{c}{k}$ RDWY. FILL + A(CS) + A(TAN α) DOWNSTREAM HEADWALL NORMAL TO $\frac{c}{k}$ ROADWAY OR $\frac{c}{k}$ MEDIAN TAN $\frac{c}{k}$ TAN $\frac{c}{k}$ TAN α
- CROSS SLOPE OF EACH PART OF ROADWAY INCLUDING CROWN. LANES AND SHOULDERS. CS IS POSITIVE IF RISING AND NEGATIVE IF FALLING AWAY FROM & ROADWAY OR & MEDIAN.

THE TERM "ALCS)" IS THE DIFFERENCE IN ELEVATION BETWEEN & ROADWAY OR & MEDIAN AND THE TOP OF THE FILL SLOPE NORMAL TO & ROADWAY OR & MEDIAN. THIS TERM SHALL BE ADJUSTED FOR UNSYMMETRICAL AND NONSTANDARD ROADWAYS. TO ACCOUNT FOR A VARYING PROFILE GRADE THE € ROADWAY FILL SHALL BE BASED ON STATIONS THAT CORRESPOND TO THE CORNERS OF THE INSIDE FACE OF THE HEADWALLS THAT PRODUCE MAXIMUM VALUES FOR B AND C.

SEE ROADWAY PLANS FOR SLOPES, & ROADWAY FILL AND ELEVATIONS 1 AND 2. ELEVATIONS 1 AND 2 CORRESPOND TO UPPER AND LOWER FLOW LINE ELEVATIONS AND MAY BE BELOW THE NATURAL STREAM BOTTOM DUE TO ENVIRONMENTAL REQUIREMENTS.

	LAYOUT DI	MENSI	DNS
VARIABLE	DIMENSION	VARIABLE	DIMENSION
×	SEE EQUATIONS	P	2V(SEC 20°)
β	SEE EQUATIONS	0	TX(COS 20°)
В	SEE EQUATIONS	R	P(COS 20°)
С	SEE EQUATIONS	U	(R + M)(TAN 20°)
D	R + M + N + 20"	٧	HT + TS - 12"
E	G + 23"	W	2A + B + C + D + E
F	S + 2TX	Y	TX(SIN 20°)
G	2 V	кк	S/2 + U
М	N(COS 20°)	Τ₩	MAX{3'-4" OR (BS + 12")}
N	3" + TX(TAN 10°)		

GENERAL NOTES:

DESIGN SPECIFICATIONS: 2010 AASHTO LRFD BRIDGE DESIGN SPECFICATIONS AND 2010 INTERIM REVISIONS

DESIGN LOADING: VEHICULAR = HL-93 MINUS LANE LOAD. EARTH = 120 LB/CF EQUIVALENT FLUID PRESSURE = 30 LB/CF (MIN.). 60 LB/CF (MAX.)

DESIGN UNIT STRESSES: CLASS B-1 CONCRETE (BOX CULVERT) f'c = 4.000 PSI REINFORCING STEEL (GRADE 60) fy = 60.000 PSI

MISCELLANEOUS: FOR REINFORCEMENT DETAILS. SEE SHEET 2 OF 3. FOR SECTION DETAILS. SEE SHEET 3 OF 3. FOR MEMBER THICKNESS. SEE 703.17.

DRAWING NOT TO SCALE. FOLLOW DIMENSIONS.

DIMENSIONS ARE IN INCHES UNLESS OTHERWISE NOTED.

WHEN ALTERNATE PRECAST CONCRETE BOX CULYERT SECTIONS ARE USED. THE MINIMUM DISTANCE FROM INSIDE FACE OF HEADWALLS TO PRECAST SECTIONS MEASURED ALONG THE SHORTEST WALL SHALL BE 3 FEET. REINFORCEMENT AND DIMENSIONS FOR WINDS AND HEADWALLS SHALL BE IN ACCORDANCE WITH MISSOURI STANDARD PLANS.



- CONST

DETAIL A

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)



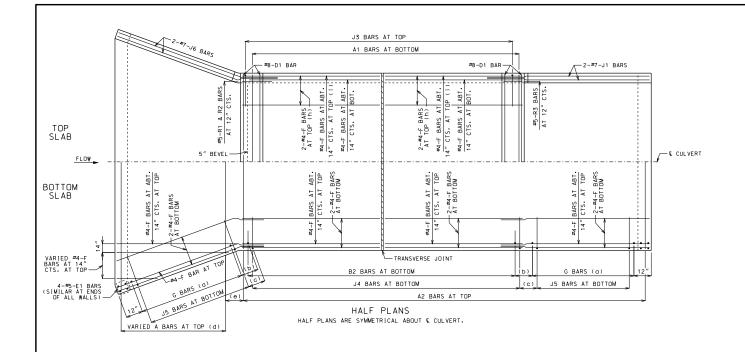
CONCRETE SINGLE BOX CULVERT

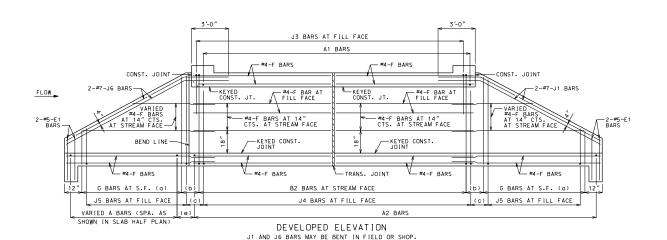
SKEW: SQUARED WINGS: FLARED

LAYOUT

DATE EFFECTIVE: 07/01/2015 DATE PREPARED:

703.11J





LAYING OUT TRANVERSE JOINTS UNLESS SHOWN ON ROADWAY OR BRIDGE PLANS

USE A TRANSVERSE JOINT WHEN BARREL LENGTH IS OVER 80 FEET. USE ADDITIONAL JOINTS TO LIMIT CUT SECTION LENGTH AND END SECTION BARREL LENGTH MEASURED ALONG CHETRLING OF CULVENT TO 50 FEET.

MINIMUM END SECTION LENGTH SHALL BE 3 FEET MEASURED ALONG THE SHORTEST WALL FROM THE INSIDE FACE OF HEADWALL TO THE TRANSVERSE JOINT.

TO AVOID LOCATING TRANSVERSE JOINTS UNDER A TRAVELED WAY WITH DESIGN FILLS 2 FEET OR LESS THE FOLLOWING SHALL APPLY:

BARREL LENGTH UP TO 90 FEET WITHOUT A TRANSVERSE JOINT

CUT SECTION LENGTHS UP TO 60 FEET

WHEN BARREL AND CUT SECTION LENGTH RESTRICTIONS REQUIRE TRANSVERSE JOINTS TO BE LOCATED UNDER A TRAVELED WAY WITH DESIGN FILLS 2 FEET OR LESS. THE JOINTS SHALL BE LOCATED TO MINIMIZE THE LENGTH OF JOINT UNDER THE TRAVELED WAY.

TRAVELED WAY IS THE ROADWAY WIDTH MINUS SHOULDER WIDTHS.

FOR CUT SECTION DETAILS. SEE 703.16.

GENERAL NOTES:

FOR SECTIONS THRU BARREL, WINGS AND HEADWALLS, SEE SHEET 3 OF 3. FOR BAR SIZES, SPACING AND DIMENSIONS OF ALL REINFORCEMENT EXCEPT JS BARS, SEE 703.17. FOR JS BARS, SEE 703.37.

CONSTRUCTION JOINT KEY NOT SHOWN FOR CLARITY IN HALF PLANS AND ELEVATION. SEE SHEET 3 OF 3 FOR DETAILS.

DRAWING NOT TO SCALE. FOLLOW DIMENSIONS.

MINIMUM CLEARANCE TO REINFORCING STEEL SHALL BE $1\frac{1}{2}"$.

LAP LONGITUDINAL BARS A MINIMUM OF 23" AT SPLICES.

BEVELED HEADWALL SHALL BE LOCATED AT UPSTREAM END.

(a) SAME SIZE AND SPACING AS B2 BARS

(b) VARIES. 12" MAXIMUM

(c) J4 BAR SPACING

(d) SAME SIZE AND SPACING AS B2 BARS

(e) A2 BAR SPACING

(f) NOT SPECIFIED ON THIS SHEET

(g) NOT SPECIFIED ON THIS SHEET

(h) FOR DESIGN FILLS OVER 2'-0"

(i) FOR DESIGN FILLS 2'-0" OR LESS



MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)



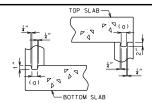
SINGLE BOX CULVERT

SKEW: SQUARED WINGS: FLARED

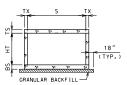
REINFORCEMENT

DATE EFFECTIVE: 07/01/2015 DATE PREPARED:

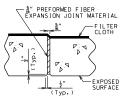
703.11J



KEYED CONSTRUCTION JOINT (a) APPROXIMATELY ONE-THIRD OF WALL THICKNESS

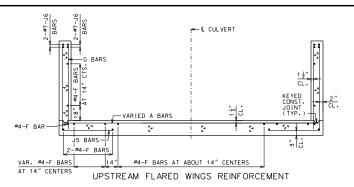


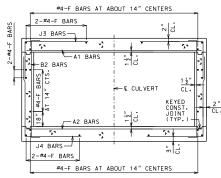
GRANULAR BACKFILL LIMITS AND MEMBER DIMENSIONS

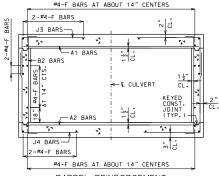


TRANSVERSE JOINT THRU BARREL PREFORMED FIBER EXPANSION JOINT MATERIAL IN ACCORDANCE WITH SEC 1057 SHALL BE SECURELY STITCHED TO ONE FACE OF THE CONCRETE WITH 10 GAGE COPPER WIRE OR 12 GAGE SOFT DRAWN GALVANIZED STEEL WIRE.

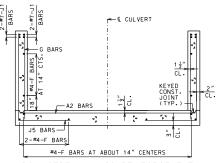
FILTER CLOTH 3 FEET IN WIDTH AND DOUBLE
THICKNESS SHALL BE CENTERED ON TRANSVERSE JOINTS
IN TOP SLAB AND SIDEWALLS WITH EOGES SEALED WITH
MASTIC OR TWO SIDED TAPE. FILTER CLOTH SHALL BE
A SUBSURFACE DRAINAGE GEOTEXTILE IN ACCORDANCE
WITH SEC 1011. COST OF FURNISHING AND INSTALLING
FILTER CLOTH WILL BE CONSIDERED COMPLETELY
COVERED BY THE CONTRACT UNIT PRICE FOR OTHER
ITEMS.



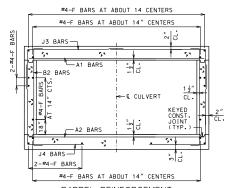




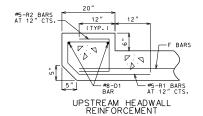
BARREL REINFORCEMENT FOR DESIGN FILLS OVER 2'-0"

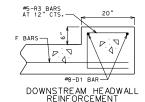


DOWNSTREAM WINGS REINFORCEMENT



BARREL REINFORCEMENT FOR DESIGN FILLS 2'-0" OR LESS





GENERAL NOTES:

FOR MEMBER THICKNESS AND FOR BAR SIZES, SPACING AND DIMENSIONS OF ALL REINFORCEMENT EXCEPT J5 BARS, SEE 703.37. FOR J5 BARS, SEE 703.37.

BARREL AND WINGS SECTIONS ARE SYMMETRICAL ABOUT AND NORMAL TO © CULVERT. HEADWALL SECTIONS ARE NORMAL TO LONG DIRECTION OF HEADWALL.

DRAWING NOT TO SCALE. FOLLOW DIMENSIONS.

MINIMUM CLEARANCE TO REINFORCING STEEL SHALL BE $1\frac{1}{2}$.



MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)



CONCRETE SINGLE BOX CULVERT

SKEW: SQUARED WINGS: FLARED

SECTIONS

DATE EFFECTIVE: 07/01/2015 DATE PREPARED:

703.11J

CHANNEL BOTTOM SHALL BE GRADED WITHIN RIGHT OF WAY FOR TRANSITION OF CHANNEL BED TO CULVERT OPENINGS. CHANNEL BANKS SHALL BE TAPERED TO MATCH CULVERT OPENINGS.

DETAIL A

EQUATIONS FOR COMPUTING \propto , β , B AND C

- ≃ = ANGLE OF BARREL SLOPE WITH HORIZONTAL NORMAL TO € ROADWAY OR € MEDIAN = ARCTAN (ELEV. 1 ELEV. 2)
- β = ANGLE OF FILL SLOPE WITH HORIZONTAL NORMAL TO € ROADWAY OR € MEDIAN = ARCTAN (VER.)
- HORIZONTAL DISTANCE FROM UPSTREAM EDGE OF SHOULDER TO = € RDWY. FILL + A(CS) A(TAN∝) UPSTREAM HEADWALL NORMAL TO € ROADWAY OR € MEDIAN TAN® + TAN∞
- C = HORIZONTAL DISTANCE FROM DOWNSTREAM EDGE OF SHOULDER TO = $\frac{c}{k}$ RDWY. FILL + A(CS) + A(TAN α) DOWNSTREAM HEADWALL NORMAL TO $\frac{c}{k}$ ROADWAY OR $\frac{c}{k}$ MEDIAN TAN $\frac{c}{k}$ TAN $\frac{c}{k}$ TAN α
- CROSS SLOPE OF EACH PART OF ROADWAY INCLUDING CROWN. LANES AND SHOULDERS. CS IS POSITIVE IF RISING AND NEGATIVE IF FALLING AWAY FROM & ROADWAY OR & MEDIAN.

THE TERM "ALCS)" IS THE DIFFERENCE IN ELEVATION BETWEEN & ROADWAY OR & MEDIAN AND THE TOP OF THE FILL SLOPE NORMAL TO & ROADWAY OR & MEDIAN. THIS TERM SHALL BE ADJUSTED FOR UNSYMMETRICAL AND NONSTANDARD ROADWAYS. TO ACCOUNT FOR A VARYING PROFILE GRADE THE & ROADWAY FILL SHALL BE BASED ON STATIONS THAT CORRESPOND TO THE CORNERS OF THE INSIDE FACE OF THE HEADWALLS THAT PRODUCE MAXIMUM VALUES FOR B AND C.

SEE ROADWAY PLANS FOR SLOPES. & ROADWAY FILL AND ELEVATIONS 1 AND 2. ELEVATIONS 1 AND 2 CORRESPOND TO UPPER AND LOWER FLOW LINE ELEVATIONS AND MAY BE BELOW THE NATURAL STREAM BOTTOM DUE TO ENVIRONMENTAL REQUIREMENTS.

	LAYOUT DI	MENSI	ONS
VARIABLE	DIMENSION	VARIABLE	DIMENSION
×	SEE EQUATIONS	T	G(SEC Z)
β	SEE EQUATIONS	٧	HT + TS - 12"
В	SEE EQUATIONS	W	2A + B + C + 2E
С	SEE EQUATIONS	х	3" + TX(TAN Z)
E	G + D + 20"	Z	SKEW ANGLE
F	S + 2TX	BB	(A + B)(SEC Z)
G	2 V	cc	(A + C)(SEC Z)
Н	(A + C + E)(TAN Z)	EE	E(SEC Z)
I	3"(COS Z)	НН	20"(SEC Z)
J	(A + B + E)(TAN Z)	00	TX(COS Z)
К	S(SEC Z)/2	YY	TX(SIN Z)
L	2EE + BB + CC	Τ₩	MAX{3'-4" OR (BS + 12")}
n	1 + 44		

GENERAL NOTES:

DESIGN SPECIFICATIONS: 2010 AASHTO LRFD BRIDGE DESIGN SPECFICATIONS AND 2010 INTERIM REVISIONS

DESIGN LOADING: VEHICULAR = HL-93 MINUS LANE LOAD. EARTH = 120 LB/CF EQUIVALENT FLUID PRESSURE = 30 LB/CF (MIN.). 60 LB/CF (MAX.)

DESIGN UNIT STRESSES: CLASS B-1 CONCRETE (BOX CULVERT) f'c = 4.000 PSI REINFORCING STEEL (GRADE 60) fy = 60.000 PSI

MISCELLANEOUS: FOR REINFORCEMENT DETAILS. SEE SHEET 2 OF 3. FOR SECTION DETAILS. SEE SHEET 3 OF 3. FOR MEMBER THICKNESS. SEE 703.17.

DRAWING NOT TO SCALE. FOLLOW DIMENSIONS.

DIMENSIONS ARE IN INCHES UNLESS OTHERWISE NOTED.

WHEN ALTERNATE PRECAST CONCRETE BOX CULYERT SECTIONS ARE USED. THE MINIMUM DISTANCE FROM INSIDE FACE OF HEADWALLS TO PRECAST SECTIONS MEASURED ALONG THE SHORTEST WALL SHALL BE 3 FEET. REINFORCEMENT AND DIMENSIONS FOR WINDS AND HEADWALLS SHALL BE IN ACCORDANCE WITH MISSOURI STANDARD PLANS.



MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)



CONCRETE SINGLE BOX CULVERT

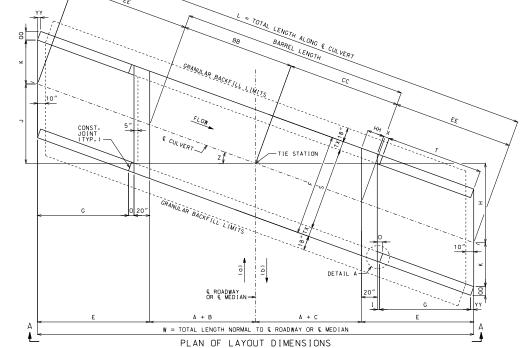
SKEW: LEFT ADVANCE WINGS: STRAIGHT

LAYOUT

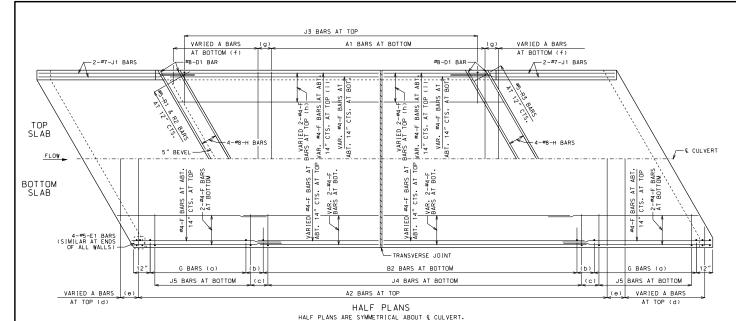
DATE EFFECTIVE: 07/01/2015 DATE PREPARED:

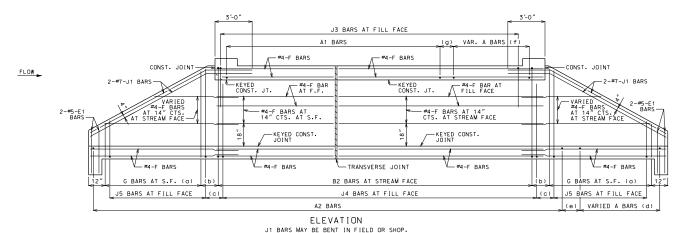
703.12J

SHEET NO. 1 OF 3



(g) AHEAD STATION WHERE STREAM FLOWS LEFT TO RIGHT. (b) AHEAD STATION WHERE STREAM FLOWS RIGHT TO LEFT.





MODOT m OF MISSOUR

LAYING OUT TRANVERSE JOINTS UNLESS SHOWN ON ROADWAY OR BRIDGE PLANS

USE A TRANSVERSE JOINT WHEN BARREL LENGTH IS OVER 80 FEET. USE ADDITIONAL JOINTS TO LIMIT CUT SECTION LENGTH AND END SECTION BARREL LENGTH MEASURED ALONG CHETRLING OF CULVENT TO 50 FEET.

MINIMUM END SECTION LENGTH SHALL BE 3 FEET MEASURED ALONG THE SHORTEST WALL FROM THE INSIDE FACE OF HEADWALL TO THE TRANSVERSE JOINT.

TO AVOID LOCATING TRANSVERSE JOINTS UNDER A TRAVELED WAY WITH DESIGN FILLS 2 FEET OR LESS THE FOLLOWING SHALL APPLY:

BARREL LENGTH UP TO 90 FEET WITHOUT A TRANSVERSE JOINT

WHEN BARREL AND CUT SECTION LENGTH RESTRICTIONS REQUIRE TRANSVERSE JOINTS TO BE LOCATED UNDER A TRAVELED WAY WITH DESIGN FILLS 2 FEET OR LESS. THE JOINTS SHALL BE LOCATED TO MINIMIZE THE LENGTH OF JOINT UNDER THE TRAVELED WAY.

TRAVELED WAY IS THE ROADWAY WIDTH MINUS SHOULDER WIDTHS.

FOR CUT SECTION DETAILS. SEE 703.16.

GENERAL NOTES:

FOR SECTIONS THRU BARREL, WINGS AND HEADWALLS, SEE SHEET 3 OF 3. FOR BAR SIZES, SPACING AND DIMENSIONS OF ALL REINFORCEMENT EXCEPT JS BARS, SEE 703.17. FOR JS BARS, SEE 703.37.

CONSTRUCTION JOINT KEY NOT SHOWN FOR CLARITY IN HALF PLANS AND ELEVATION. SEE SHEET 3 OF 3 FOR DETAILS.

DRAWING NOT TO SCALE. FOLLOW DIMENSIONS.

MINIMUM CLEARANCE TO REINFORCING STEEL SHALL BE $1\frac{1}{2}"$.

LAP LONGITUDINAL BARS A MINIMUM OF 23" AT SPLICES.

BEVELED HEADWALL SHALL BE LOCATED AT UPSTREAM END.

(a) SAME SIZE AND SPACING AS B2 BARS

(b) VARIES. 12" MAXIMUM

(c) J4 BAR SPACING

(d) SAME SIZE AND SPACING AS A2 BARS

(e) A2 BAR SPACING

(f) SAME SIZE AND SPACING AS A1 BARS

(q) A1 BAR SPACING

DENNIS W. HECKMAN

NUMBER PE-27141

PE-27/41 ES

(h) FOR DESIGN FILLS OVER 2'-0"

(i) FOR DESIGN FILLS 2'-0" OR LESS

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

105 WEST CAPITOL JEFFERSON CITY MO 65102 1-888-ASK-MODOT (1-888-275-6636)

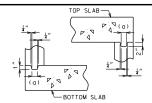
CONCRETE SINGLE BOX CULVERT

SKEW: LEFT ADVANCE WINGS: STRAIGHT

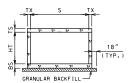
REINFORCEMENT

DATE EFFECTIVE: 07/01/2015 DATE PREPARED:

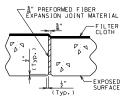
703.12J



KEYED CONSTRUCTION JOINT (a) APPROXIMATELY ONE-THIRD OF WALL THICKNESS

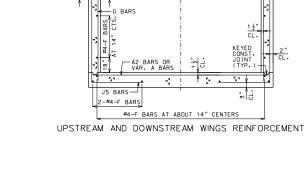


GRANULAR BACKFILL LIMITS AND MEMBER DIMENSIONS

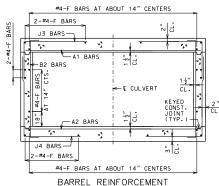


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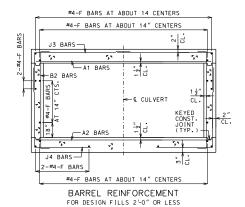
FILTER CLOTH 3 FEET IN WIDTH AND DOUBLE
THICKNESS SHALL BE CENTERED ON TRANSVERSE JOINTS
IN TOP SLAB AND SIDEWALLS WITH EOGES SEALED WITH
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COVERED BY THE CONTRACT UNIT PRICE FOR OTHER
ITEMS.



-#7-J1 BARS



FOR DESIGN FILLS OVER 2'-0"



#5-R3 BARS AT 12" CTS. 4

DOWNSTREAM HEADWALL REINFORCEMENT

#8-D1 BAR---

BARS

GENERAL NOTES: FOR MEMBER THICKNESS AND FOR BAR SIZES, SPACING AND DIMENSIONS OF ALL REINFORCEMENT EXCEPT J5 BARS, SEE 703.37. FOR J5 BARS, SEE 703.37.

r € CULVERT

KEYED CONST. JOINT (TYP.)

BARREL AND WINGS SECTIONS ARE SYMMETRICAL ABOUT AND NORMAL TO © CULVERT. HEADWALL SECTIONS ARE NORMAL TO LONG DIRECTION OF HEADWALL.

DRAWING NOT TO SCALE. FOLLOW DIMENSIONS.

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MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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CONCRETE SINGLE BOX CULVERT

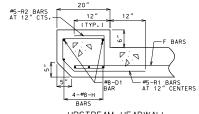
SKEW: LEFT ADVANCE WINGS: STRAIGHT

SECTIONS

DATE EFFECTIVE: 07/01/2015 DATE PREPARED:

703.12J

SHEET NO. 3 OF 3



UPSTREAM HEADWALL REINFORCEMENT

OF MISSOUR

- CRAMULAR BACKETLL LIMITS

FLOW

ORANULAR BACKFILL LIMITS

€ ROADWAY OR € MEDIAN →

₩ = TOTAL LENGTH NORMAL TO € ROADWAY OR € MEDIAN

PLAN OF LAYOUT DIMENSIONS

(g) AHEAD STATION WHERE STREAM FLOWS LEFT TO RIGHT. (b) AHEAD STATION WHERE STREAM FLOWS RIGHT TO LEFT.

TIE STATION

DETAIL B

€ CUL VERT

CONST. JOINT (TYP.)

H

ММ

SS

DETAIL A-

DETAIL C

RR

EQUATIONS FOR COMPUTING \propto , β , B AND C

- β = ANGLE OF FILL SLOPE WITH HORIZONTAL NORMAL TO € ROADWAY OR € MEDIAN = ARCTAN (VER.\(\frac{1}{400R}\).
- HORIZONTAL DISTANCE FROM UPSTREAM EDGE OF SHOULDER TO = € RDWY. FILL + A(CS) A(TAN∝) UPSTREAM HEADWALL NORMAL TO € ROADWAY OR € MEDIAN TAN® + TAN∞
- C = HORIZONTAL DISTANCE FROM DOWNSTREAM EDGE OF SHOULDER TO = $\frac{c}{k}$ RDWY. FILL + A(CS) + A(TAN α) DOWNSTREAM HEADWALL NORMAL TO $\frac{c}{k}$ ROADWAY OR $\frac{c}{k}$ MEDIAN TAN $\frac{c}{k}$ TAN $\frac{c}{k}$ TAN α
- CROSS SLOPE OF EACH PART OF ROADWAY INCLUDING CROWN. LANES AND SHOULDERS. CS IS POSITIVE IF RISING AND NEGATIVE IF FALLING AWAY FROM & ROADWAY OR & MEDIAN.

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SEE ROADWAY PLANS FOR SLOPES. & ROADWAY FILL AND ELEVATIONS 1 AND 2. ELEVATIONS 1 AND 2 CORRESPOND TO UPPER AND LOWER FLOW LINE ELEVATIONS AND MAY BE BELOW THE NATURAL STREAM BOTTOM DUE TO ENVIRONMENTAL REQUIREMENTS.

		LAY	OUT DIMENSIONS		
VARIABLE	DIMENSION	VARIABLE	DIMENSION	VARIABLE	DIMENSION
×	SEE EQUATIONS	Ŋ	3" + TX(TAN 10°)	cc	(A + C)(SEC Z)
β	SEE EQUATIONS	0	I + YY	DD	R + M + N + 20"
В	SEE EQUATIONS	P	2V[SEC(Z + 20°)]	EE	E(SEC Z)
С	SEE EQUATIONS	0	TX(COS 20°)	нн	20"(SEC Z)
D	Z ≥ 20°: II + MM + RR	R	P(COS 20°)	11	20"(COS Z)
, b	Z < 20°: II + MM + RR + TT	Т	G(SEC Z)	KK	S/2 + U
E	G + O + 20"	U	(R + M)(TAN 20°)	LL	(AA + BB + DD)(COS Z)
F	S + 2TX	٧	HT + TS - 12"	ММ	3"[COS Z + COS(Z - 20°)]
G	2 V	W	2A + B + C + D + E + SS	00	TX(COS Z)
Н	(A + C + E)(TAN Z)	х	3" + TX(TAN Z)	RR	P[COS (Z - 20°)]
I	3"(COS Z)	Y	TX(SIN 20°)	SS	F(SIN Z)
J	(AA + BB + DD)(SIN Z)	Z	SKEW ANGLE	TT	TX[SIN(20° - Z)]
К	S(SEC Z)/2	AA	F(TAN Z)/2	YY	TX(SIN Z)
L	AA + BB + CC + DD + EE	BB	(A + B)(SEC Z)	Τ₩	MAX{3'-4" OR (BS + 12")}
М	N(COS 20°)		SENERAL MOTECT		



DETAIL C For Z < 20°



DETAIL B





DETAIL A

GENERAL NOTES:

DESIGN SPECIFICATIONS: 2010 AASHTO LRFD BRIDGE DESIGN SPECFICATIONS AND 2010 INTERIM REVISIONS

DESIGN LOADING: VEHICULAR = HL-93 MINUS LANE LOAD, EARTH = 120 LB/CF EQUIVALENT FLUID PRESSURE = 30 LB/CF (MIN.), 60 LB/CF (MAX.)

DESIGN UNIT STRESSES: CLASS B-1 CONCRETE (BOX CULVERT) f'c = 4.000 PSI REINFORCING STEEL (GRADE 60) fy = 60.000 PSI

MISCELLANEOUS: FOR REINFORCEMENT DETAILS. SEE SHEET 2 OF 3. FOR SECTION DETAILS. SEE SHEET 3 OF 3. FOR MEMBER THICKNESS. SEE 703.17.

DRAWING NOT TO SCALE. FOLLOW DIMENSIONS.

DIMENSIONS ARE IN INCHES UNLESS OTHERWISE NOTED.

WHEN ALTERNATE PRECAST CONCRETE BOX CULYERT SECTIONS ARE USED. THE MINIMUM DISTANCE FROM INSIDE FACE OF HEADWALLS TO PRECAST SECTIONS MEASURED ALONG THE SHORTEST WALL SHALL BE 3 FEET. REINFORCEMENT AND DIMENSIONS FOR WINDS AND HEADWALLS SHALL BE IN ACCORDANCE WITH MISSOURI STANDARD PLANS.

MISSOURI HIGHWAYS AND TRANSPORTATION MODOT COMMISSION 105 WEST CAPITOL

JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)



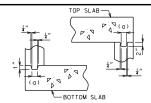
CONCRETE SINGLE BOX CULVERT SKEW: LEFT ADVANCE

WINGS: FLARED

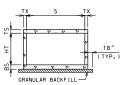
LAYOUT

DATE EFFECTIVE: 07/01/2015 DATE PREPARED:

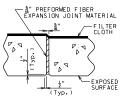
703.13J



KEYED CONSTRUCTION JOINT (a) APPROXIMATELY ONE-THIRD OF WALL THICKNESS

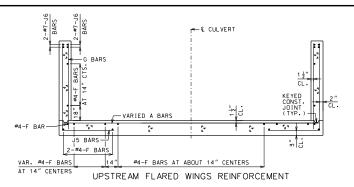


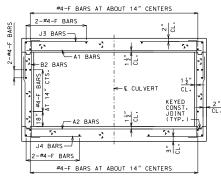
GRANULAR BACKFILL LIMITS AND MEMBER DIMENSIONS

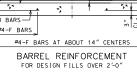


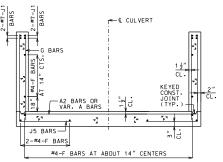
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FILTER CLOTH 3 FEET IN WIDTH AND DOUBLE
THICKNESS SHALL BE CENTERED ON TRANSVERSE JOINTS
IN TOP SLAB AND SIDEWALLS WITH EOGES SEALED WITH
MASTIC OR TWO SIDED TAPE. FILTER CLOTH SHALL BE
A SUBSURFACE DRAINAGE GEOTEXTILE IN ACCORDANCE
WITH SEC 1011. COST OF FURNISHING AND INSTALLING
FILTER CLOTH WILL BE CONSIDERED COMPLETELY
COVERED BY THE CONTRACT UNIT PRICE FOR OTHER
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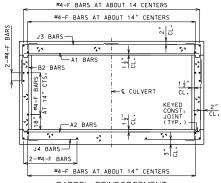




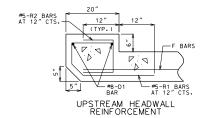


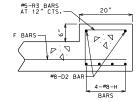


DOWNSTREAM WINGS REINFORCEMENT



BARREL REINFORCEMENT FOR DESIGN FILLS 2'-0" OR LESS





DOWNSTREAM HEADWALL REINFORCEMENT

GENERAL NOTES:

FOR MEMBER THICKNESS AND FOR BAR SIZES, SPACING AND DIMENSIONS OF ALL REINFORCEMENT EXCEPT J5 BARS, SEE 703.37. FOR J5 BARS, SEE 703.37.

BARREL AND WINGS SECTIONS ARE SYMMETRICAL ABOUT AND NORMAL TO © CULVERT. HEADWALL SECTIONS ARE NORMAL TO LONG DIRECTION OF HEADWALL.

DRAWING NOT TO SCALE. FOLLOW DIMENSIONS.

MINIMUM CLEARANCE TO REINFORCING STEEL SHALL BE $1\frac{1}{2}$.



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CONCRETE SINGLE BOX CULVERT

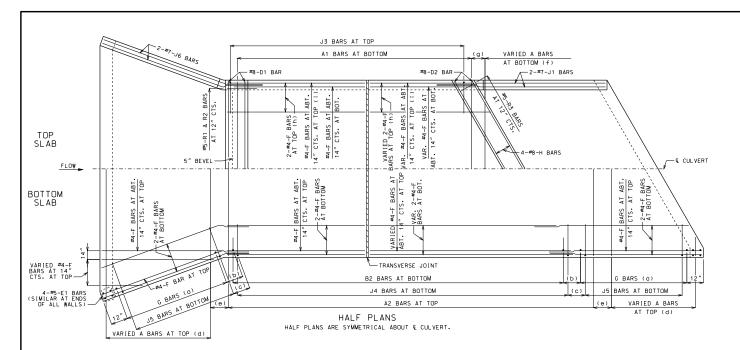
SKEW: LEFT ADVANCE WINGS: FLARED

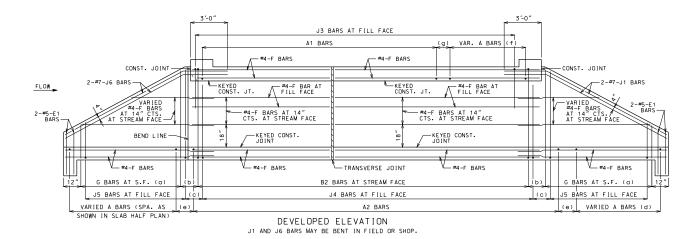
SECTIONS

DATE EFFECTIVE: DATE PREPARED:

07/01/2015

703.13J





LAYING OUT TRANVERSE JOINTS UNLESS SHOWN ON ROADWAY OR BRIDGE PLANS

USE A TRANSVERSE JOINT WHEN BARREL LENGTH IS OVER 80 FEET. USE ADDITIONAL JOINTS TO LIMIT CUT SECTION LENGTH AND END SECTION BARREL LENGTH MEASURED ALONG CHETRLING OF CULVENT TO 50 FEET.

MINIMUM END SECTION LENGTH SHALL BE 3 FEET MEASURED ALONG THE SHORTEST WALL FROM THE INSIDE FACE OF HEADWALL TO THE TRANSVERSE JOINT.

TO AVOID LOCATING TRANSVERSE JOINTS UNDER A TRAVELED WAY WITH DESIGN FILLS 2 FEET OR LESS THE FOLLOWING SHALL APPLY:

BARREL LENGTH UP TO 90 FEET WITHOUT A TRANSVERSE JOINT

CUT SECTION LENGTHS UP TO 60 FEET

WHEN BARREL AND CUT SECTION LENGTH RESTRICTIONS REQUIRE TRANSVERSE JOINTS TO BE LOCATED UNDER A TRAVELED WAY WITH DESIGN FILLS 2 FEET OR LESS. THE JOINTS SHALL BE LOCATED TO MINIMIZE THE LENGTH OF JOINT UNDER THE TRAVELED WAY.

TRAVELED WAY IS THE ROADWAY WIDTH MINUS SHOULDER WIDTHS.

FOR CUT SECTION DETAILS. SEE 703.16.

GENERAL NOTES:

FOR SECTIONS THRU BARREL, WINGS AND HEADWALLS, SEE SHEET 3 OF 3. FOR BAR SIZES, SPACING AND DIMENSIONS OF ALL REINFORCEMENT EXCEPT JS BARS, SEE 703.17. FOR JS BARS, SEE 703.37.

CONSTRUCTION JOINT KEY NOT SHOWN FOR CLARITY IN HALF PLANS AND ELEVATION. SEE SHEET 3 OF 3 FOR DETAILS.

DRAWING NOT TO SCALE. FOLLOW DIMENSIONS.

MINIMUM CLEARANCE TO REINFORCING STEEL SHALL BE 1 $\frac{1}{2}$ ".

LAP LONGITUDINAL BARS A MINIMUM OF 23" AT SPLICES.

BEVELED HEADWALL SHALL BE LOCATED AT UPSTREAM END.

- (a) SAME SIZE AND SPACING AS B2 BARS
- (b) VARIES. 12" MAXIMUM
- (c) J4 BAR SPACING
- (d) SAME SIZE AND SPACING AS A2 BARS
- (e) A2 BAR SPACING
- (f) SAME SIZE AND SPACING AS A1 BARS
- (g) A1 BAR SPACING

OF MISSOUR

DENNIS W. HECKMAN

NUMBER PE-27141

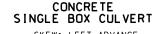
PE-27/41 ES

- (h) FOR DESIGN FILLS OVER 2'-0"
- (i) FOR DESIGN FILLS 2'-0" OR LESS



MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

105 WEST CAPITOL JEFFERSON CITY MO 65102 1-888-ASK-MODOT (1-888-275-6636)



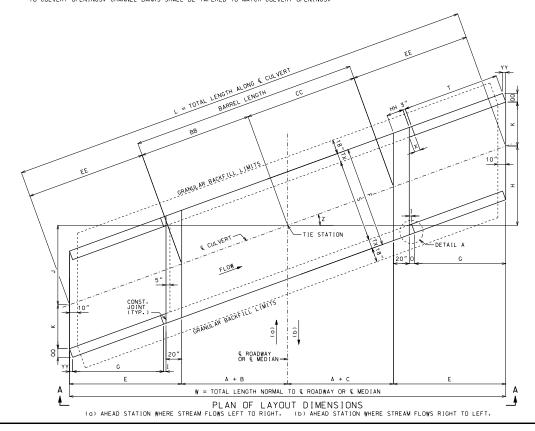
SKEW: LEFT ADVANCE WINGS: FLARED

REINFORCEMENT

DATE EFFECTIVE: 07/01/2015 DATE PREPARED:

703.13J

CHANNEL BOTTOM SHALL BE GRADED WITHIN RIGHT OF WAY FOR TRANSITION OF CHANNEL BED TO CULVERT OPENINGS. CHANNEL BANKS SHALL BE TAPERED TO MATCH CULVERT OPENINGS.



EQUATIONS FOR COMPUTING \propto , β , B AND C

- ≃ = ANGLE OF BARREL SLOPE WITH HORIZONTAL NORMAL TO € ROADWAY OR € MEDIAN = ARCTAN (ELEV. 1 ELEV. 2)
- β = ANGLE OF FILL SLOPE WITH HORIZONTAL NORMAL TO & ROADWAY OR & MEDIAN = ARCTAN (VER. HOR.
- B = HORIZONTAL DISTANCE FROM UPSTREAM EDGE OF SHOULDER TO = € RDWY. FILL + A(CS) A(TAN∝)
 UPSTREAM HEADWALL NORMAL TO € ROADWAY OR € MEDIAN

 TANβ + TANα
- C = HORIZONTAL DISTANCE FROM DOWNSTREAM EDGE OF SHOULDER TO = $\frac{C}{C}$ RDWY. FILL + A(CS) + A(TAN \propto) DOWNSTREAM HEADWALL NORMAL TO $\frac{C}{C}$ ROADWAY OR $\frac{C}{C}$ MEDIAN TAN $\frac{C}{C}$ TAN $\frac{C}{C}$
- CROSS SLOPE OF EACH PART OF ROADWAY INCLUDING CROWN, LANES AND SHOULDERS. CS IS POSITIVE IF RISING AND NEGATIVE IF FALLING AWAY FROM & ROADWAY OR & MEDIAN.

THE TERM "ALCS)" IS THE DIFFERENCE IN ELEVATION BETWEEN & ROADWAY OR & MEDIAN AND THE TOP OF THE FILL SLOPE NORMAL TO & ROADWAY OR & MEDIAN. THIS TERM SHALL BE ADJUSTED FOR UNSYMMETRICAL AND NONSTANDARD ROADWAYS. TO ACCOUNT FOR A VARYING PROFILE GRADE THE & ROADWAY FILL SHALL BE BASED ON STATIONS THAT CORRESPOND TO THE CORNERS OF THE INSIDE FACE OF THE HEADWALLS THAT PRODUCE MAXIMUM VALUES FOR B AND C.

SEE ROADWAY PLANS FOR SLOPES, & ROADWAY FILL AND ELEVATIONS 1 AND 2. ELEVATIONS 1 AND 2 CORRESPOND TO UPPER AND LOWER FLOW LINE ELEVATIONS AND MAY BE BELOW THE NATURAL STREAM BOTTOM DUE TO ENVIRONMENTAL REQUIREMENTS.

	LAYOUT DI	MENSI	DNS
VARIABLE	DIMENSION	VARIABLE	DIMENSION
×	SEE EQUATIONS	T	G(SEC Z)
β	SEE EQUATIONS	٧	HT + TS - 12"
В	SEE EQUATIONS	w	2A + B + C + 2E
С	SEE EQUATIONS	х	3" + TX(TAN Z)
E	G + O + 20"	Z	SKEW ANGLE
F	S + 2TX	BB	(A + B)(SEC Z)
G	2 V	cc	(A + C)(SEC Z)
Н	(A + C + E)(TAN Z)	EE	E(SEC Z)
I	3"(COS Z)	НН	20"(SEC Z)
J	(A + B + E)(TAN Z)	00	TX(COS Z)
к	S(SEC Z)/2	YY	TX(SIN Z)
L	2EE + BB + CC	Τ₩	MAX (3'-4" OR (BS + 12"))
_	1 + ٧٧		

GENERAL NOTES:

DESIGN SPECIFICATIONS: 2010 AASHTO LRFD BRIDGE DESIGN SPECFICATIONS AND 2010 INTERIM REVISIONS

DESIGN LOADING: VEHICULAR = HL-93 MINUS LANE LOAD. EARTH = 120 LB/CF (MAX.)

DESIGN UNIT STRESSES: CLASS B-1 CONCRETE (BOX CULVERT) f'c = 4.000 PSI REINFORCING STEEL (GRADE 60) fy = 60.000 PSI

MISCELLANEOUS: FOR REINFORCEMENT DETAILS. SEE SHEET 2 OF 3. FOR SECTION DETAILS. SEE SHEET 3 OF 3. FOR MEMBER THICKNESS. SEE 703.17.

DRAWING NOT TO SCALE. FOLLOW DIMENSIONS.

DIMENSIONS ARE IN INCHES UNLESS OTHERWISE NOTED.

WHEN ALTERNATE PRECAST CONCRETE BOX CULYERT SECTIONS ARE USED. THE MINIMUM DISTANCE FROM INSIDE FACE OF HEADWALLS TO PRECAST SECTIONS MEASURED ALONG THE SHORTEST WALL SHALL BE 3 FEET. REINFORCEMENT AND DIMENSIONS FOR WINDS AND HEADWALLS SHALL BE IN ACCORDANCE WITH MISSOURI STANDARD PLANS.



DETAIL A

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)



CONCRETE SINGLE BOX CULVERT

SKEW: RIGHT ADVANCE WINGS: STRAIGHT

LAYOUT

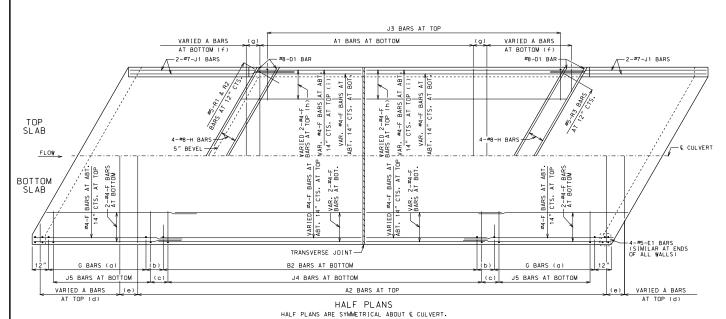
DATE EFFECTIVE: 07/01/2015 DATE PREPARED:

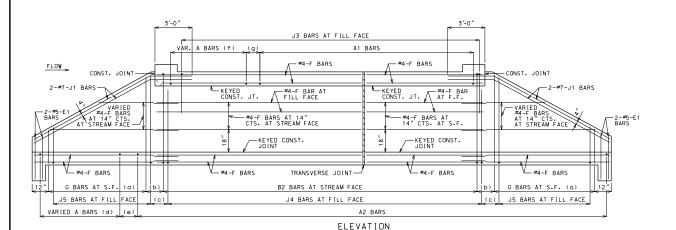
703.14J

SHEET NO.

105 WEST CAPITOL

1 OF 3





J1 BARS MAY BE BENT IN FIELD OR SHOP.

LAYING OUT TRANVERSE JOINTS UNLESS SHOWN ON ROADWAY OR BRIDGE PLANS

USE A TRANSVERSE JOINT WHEN BARREL LENGTH IS OVER 80 FEET. USE ADDITIONAL JOINTS TO LIMIT CUT SECTION LENGTH AND END SECTION BARREL LENGTH MEASURED ALONG CHETRLING OF CULVENT TO 50 FEET.

MINIMUM END SECTION LENGTH SHALL BE 3 FEET MEASURED ALONG THE SHORTEST WALL FROM THE INSIDE FACE OF HEADWALL TO THE TRANSVERSE JOINT.

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TRAVELED WAY IS THE ROADWAY WIDTH MINUS SHOULDER WIDTHS.

FOR CUT SECTION DETAILS. SEE 703.16.

GENERAL NOTES:

FOR SECTIONS THRU BARREL, WINGS AND HEADWALLS, SEE SHEET 3 OF 3. FOR BAR SIZES, SPACING AND DIMENSIONS OF ALL REINFORCEMENT EXCEPT JS BARS, SEE 703.17. FOR JS BARS, SEE 703.37.

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MINIMUM CLEARANCE TO REINFORCING STEEL SHALL BE 1 $\frac{1}{2}$ ".

LAP LONGITUDINAL BARS A MINIMUM OF 23" AT SPLICES.

BEVELED HEADWALL SHALL BE LOCATED AT UPSTREAM END.

- (a) SAME SIZE AND SPACING AS B2 BARS
- (b) VARIES. 12" MAXIMUM
- (c) J4 BAR SPACING
- (d) SAME SIZE AND SPACING AS A2 BARS
- (e) A2 BAR SPACING
- (f) SAME SIZE AND SPACING AS A1 BARS
- (q) A1 BAR SPACING
- (h) FOR DESIGN FILLS OVER 2'-0"
- (i) FOR DESIGN FILLS 2'-0" OR LESS



MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

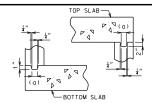
105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)



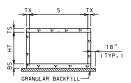
REINFORCEMENT

DATE EFFECTIVE: 07/01/2015 DATE PREPARED:

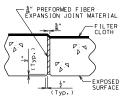
703.14J



KEYED CONSTRUCTION JOINT (a) APPROXIMATELY ONE-THIRD OF WALL THICKNESS

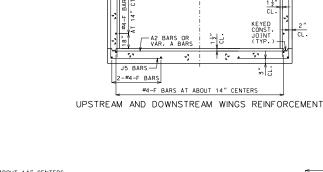


GRANULAR BACKFILL LIMITS AND MEMBER DIMENSIONS



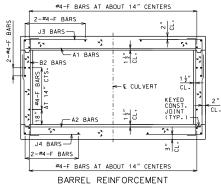
TRANSVERSE JOINT THRU BARREL PREFORMED FIBER EXPANSION JOINT MATERIAL IN ACCORDANCE WITH SEC 1057 SHALL BE SECURELY STITCHED TO ONE FACE OF THE CONCRETE WITH 10 GAGE COPPER WIRE OR 12 GAGE SOFT DRAWN GALVANIZED STEEL WIRE.

FILTER CLOTH 3 FEET IN WIDTH AND DOUBLE
THICKNESS SHALL BE CENTERED ON TRANSVERSE JOINTS
IN TOP SLAB AND SIDEWALLS WITH EOGES SEALED WITH
MASTIC OR TWO SIDED TAPE. FILTER CLOTH SHALL BE
A SUBSURFACE DRAINAGE GEOTEXTILE IN ACCORDANCE
WITH SEC 1011. COST OF FURNISHING AND INSTALLING
FILTER CLOTH WILL BE CONSIDERED COMPLETELY
COVERED BY THE CONTRACT UNIT PRICE FOR OTHER
ITEMS.

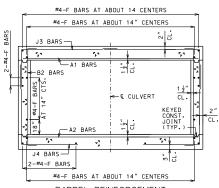


-#7-J1 BARS

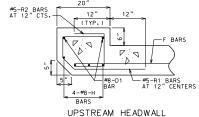
G BARS



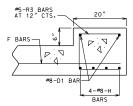
FOR DESIGN FILLS OVER 2'-0"



BARREL REINFORCEMENT FOR DESIGN FILLS 2'-0" OR LESS



UPSTREAM HEADWALL REINFORCEMENT



DOWNSTREAM HEADWALL REINFORCEMENT

GENERAL NOTES:

r € CULVERT

KEYED CONST. JOINT (TYP.)

FOR MEMBER THICKNESS AND FOR BAR SIZES, SPACING AND DIMENSIONS OF ALL REINFORCEMENT EXCEPT J5 BARS, SEE 703.37. FOR J5 BARS, SEE 703.37.

BARREL AND WINGS SECTIONS ARE SYMMETRICAL ABOUT AND NORMAL TO © CULVERT. HEADWALL SECTIONS ARE NORMAL TO LONG DIRECTION OF HEADWALL.

DRAWING NOT TO SCALE. FOLLOW DIMENSIONS.

MINIMUM CLEARANCE TO REINFORCING STEEL SHALL BE $1\frac{1}{2}$.



MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)



CONCRETE SINGLE BOX CULVERT

SKEW: RIGHT ADVANCE WINGS: STRAIGHT

SECTIONS

DATE EFFECTIVE: DATE PREPARED:

07/01/2015

703.14J

EQUATIONS FOR COMPUTING \propto , β , B AND C

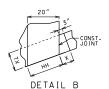
- α = ANGLE OF BARREL SLOPE WITH HORIZONTAL NORMAL TO © ROADWAY OR © MEDIAN = ARCTAN (ELEV. 1 ELEV. 2)
- β = ANGLE OF FILL SLOPE WITH HORIZONTAL NORMAL TO € ROADWAY OR € MEDIAN = ARCTAN (VER.\(\frac{1}{400R}\).
- B = HORIZONTAL DISTANCE FROM UPSTREAM EDGE OF SHOULDER TO = € RDWY. FILL + A(CS) A(TAN∝) UPSTREAM HEADWALL NORMAL TO € ROADWAY OR € MEDIAN TANβ + TANα
- C = HORIZONTAL DISTANCE FROM DOWNSTREAM EDGE OF SHOULDER TO = $\frac{c}{k}$ RDWY. FILL + A(CS) + A(TAN α) DOWNSTREAM HEADWALL NORMAL TO $\frac{c}{k}$ ROADWAY OR $\frac{c}{k}$ MEDIAN TAN $\frac{c}{k}$ TAN $\frac{c}{k}$ TAN α
- CROSS SLOPE OF EACH PART OF ROADWAY INCLUDING CROWN, LANES AND SHOULDERS. CS IS POSITIVE IF RISING AND NEGATIVE IF FALLING AWAY FROM & ROADWAY OR & MEDIAN.

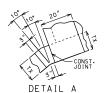
THE TERM "ALCS)" IS THE DIFFERENCE IN ELEVATION BETWEEN & ROADWAY OR & MEDIAN AND THE TOP OF THE FILL SLOPE NORMAL TO & ROADWAY OR & MEDIAN. THIS TERM SHALL BE ADJUSTED FOR UNSYMMETRICAL AND NONSTANDARD ROADWAYS. TO ACCOUNT FOR A VARYING PROFILE GRADE THE & ROADWAY FILL SHALL BE BASED ON STATIONS THAT CORRESPOND TO THE CORNERS OF THE INSIDE FACE OF THE HEADWALLS THAT PRODUCE MAXIMUM VALUES FOR B AND C.

SEE ROADWAY PLANS FOR SLOPES. & ROADWAY FILL AND ELEVATIONS 1 AND 2. ELEVATIONS 1 AND 2 CORRESPOND TO UPPER AND LOWER FLOW LINE ELEVATIONS AND MAY BE BELOW THE NATURAL STREAM BOTTOM DUE TO ENVIRONMENTAL REQUIREMENTS.

		LAY	OUT DIMENSIONS		
VARIABLE	DIMENSION	VARIABLE	DIMENSION	VARIABLE	DIMENSION
×	SEE EQUATIONS	N	3" + TX(TAN 10°)	cc	(A + C)(SEC Z)
β	SEE EQUATIONS	0	1 + YY	DD	R + M + N + 20"
В	SEE EQUATIONS	P	2V[SEC(Z + 20°)]	EE	E(SEC Z)
С	SEE EQUATIONS	0	TX(COS 20°)	нн	20"(SEC Z)
D	Z ≥ 20°: II + MM + RR	R	P(COS 20°)	ΙΙ	20"(COS Z)
, ,	Z < 20°: II + MM + RR + TT	Т	G(SEC Z)	KK	S/2 + U
E	G + O + 20"	U	(R + M)(TAN 20°)	LL	(AA + BB + DD)(COS Z)
F	S + 2TX	٧	HT + TS - 12"	MM	3"[COS Z + COS(Z - 20*)]
G	2 V	₩	2A + B + C + D + E + SS	00	TX(COS Z)
н	(A + C + E)(TAN Z)	х	3" + TX(TAN Z)	RR	P[COS (Z - 20°)]
I	3"(COS Z)	Y	TX(SIN 20°)	SS	F(SIN Z)
J	(AA + BB + DD)(SIN Z)	Z	SKEW ANGLE	TT	TX[SIN(20° - Z)]
К	S(SEC Z)/2	AA	F(TAN Z)/2	YY	TX(SIN Z)
L	AA + BB + CC + DD + EE	BB	(A + B)(SEC Z)	Τ₩	MAX{3'-4" OR (BS + 12")}
М	N(COS 20°)		SENEDAL NOTES:		







GENERAL NOTES:

DESIGN SPECIFICATIONS: 2010 AASHTO LRFD BRIDGE DESIGN SPECFICATIONS AND 2010 INTERIM REVISIONS

DESIGN LOADING: VEHICULAR = HL-93 MINUS LANE LOAD. EARTH = 120 LB/CF EQUIVALENT FLUID PRESSURE = 30 LB/CF (MIN.). 60 LB/CF (MAX.)

DESIGN UNIT STRESSES: CLASS B-1 CONCRETE (BOX CULVERT) f'c = 4.000 PSI REINFORCING STEEL (GRADE 60) fy = 60.000 PSI

MISCELLANEOUS: FOR REINFORCEMENT DETAILS. SEE SHEET 2 OF 3. FOR SECTION DETAILS. SEE SHEET 3 OF 3. FOR MEMBER THICKNESS. SEE 703.17.

DRAWING NOT TO SCALE. FOLLOW DIMENSIONS.

DIMENSIONS ARE IN INCHES UNLESS OTHERWISE NOTED.

WHEN ALTERNATE PRECAST CONCRETE BOX CULYERT SECTIONS ARE USED. THE MINIMUM DISTANCE FROM INSIDE FACE OF HEADWALLS TO PRECAST SECTIONS MEASURED ALONG THE SHORTEST WALL SHALL BE 3 FEET. REINFORCEMENT AND DIMENSIONS FOR WINDS AND HEADWALLS SHALL BE IN ACCORDANCE WITH MISSOURI STANDARD PLANS.



MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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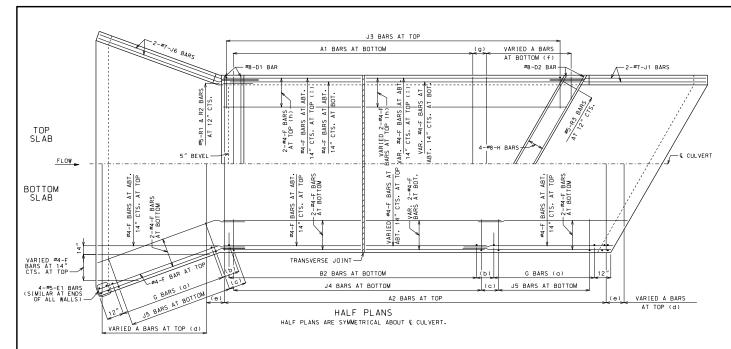
CONCRETE SINGLE BOX CULVERT

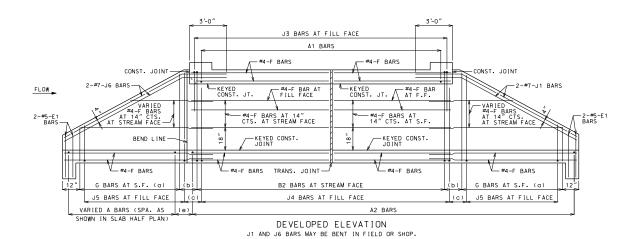
SKEW: RIGHT ADVANCE WINGS: FLARED

LAYOUT

DATE EFFECTIVE: 07/01/2015 DATE PREPARED:

703.15E





LAYING OUT TRANVERSE JOINTS UNLESS SHOWN ON ROADWAY OR BRIDGE PLANS

USE A TRANSVERSE JOINT WHEN BARREL LENGTH IS OVER 80 FEET. USE ADDITIONAL JOINTS TO LIMIT CUT SECTION LENGTH AND END SECTION BARREL LENGTH MEASURED ALONG CHETRLING OF CULVENT TO 50 FEET.

MINIMUM END SECTION LENGTH SHALL BE 3 FEET MEASURED ALONG THE SHORTEST WALL FROM THE INSIDE FACE OF HEADWALL TO THE TRANSVERSE JOINT.

TO AVOID LOCATING TRANSVERSE JOINTS UNDER A TRAVELED WAY WITH DESIGN FILLS 2 FEET OR LESS THE FOLLOWING SHALL APPLY:

BARREL LENGTH UP TO 90 FEET WITHOUT A TRANSVERSE JOINT

CUT SECTION LENGTHS UP TO 60 FEET

WHEN BARREL AND CUT SECTION LENGTH RESTRICTIONS REQUIRE TRANSVERSE JOINTS TO BE LOCATED UNDER A TRAVELED WAY WITH DESIGN FILLS 2 FEET OR LESS. THE JOINTS SHALL BE LOCATED TO MINIMIZE THE LENGTH OF JOINT UNDER THE TRAVELED WAY.

TRAVELED WAY IS THE ROADWAY WIDTH MINUS SHOULDER WIDTHS.

FOR CUT SECTION DETAILS. SEE 703.16.

GENERAL NOTES:

FOR SECTIONS THRU BARREL, WINGS AND HEADWALLS, SEE SHEET 3 OF 3. FOR BAR SIZES, SPACING AND DIMENSIONS OF ALL REINFORCEMENT EXCEPT JS BARS, SEE 703.17. FOR JS BARS, SEE 703.37.

CONSTRUCTION JOINT KEY NOT SHOWN FOR CLARITY IN HALF PLANS AND ELEVATION. SEE SHEET 3 OF 3 FOR DETAILS.

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MINIMUM CLEARANCE TO REINFORCING STEEL SHALL BE 1 $\frac{1}{2}$ ".

LAP LONGITUDINAL BARS A MINIMUM OF 23" AT SPLICES.

BEVELED HEADWALL SHALL BE LOCATED AT UPSTREAM END.

- (a) SAME SIZE AND SPACING AS B2 BARS
- (b) VARIES. 12" MAXIMUM
- (c) J4 BAR SPACING
- (d) SAME SIZE AND SPACING AS A2 BARS
- (e) A2 BAR SPACING
- (f) SAME SIZE AND SPACING AS A1 BARS
- (g) A1 BAR SPACING
- (h) FOR DESIGN FILLS OVER 2'-0"
- (i) FOR DESIGN FILLS 2'-0" OR LESS



MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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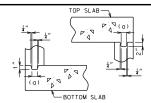
CONCRETE SINGLE BOX CULVERT

SKEW: RIGHT ADVANCE WINGS: FLARED

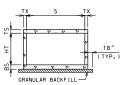
REINFORCEMENT

DATE EFFECTIVE: 07/01/2015 DATE PREPARED:

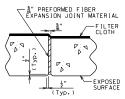
703.15E



KEYED CONSTRUCTION JOINT (a) APPROXIMATELY ONE-THIRD OF WALL THICKNESS

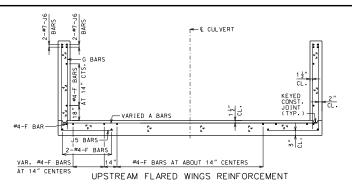


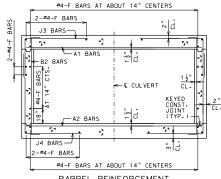
GRANULAR BACKFILL LIMITS AND MEMBER DIMENSIONS

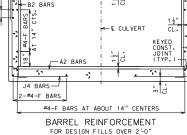


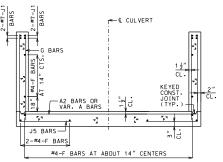
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FILTER CLOTH 3 FEET IN WIDTH AND DOUBLE
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IN TOP SLAB AND SIDEWALLS WITH EOGES SEALED WITH
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A SUBSURFACE DRAINAGE GEOTEXTILE IN ACCORDANCE
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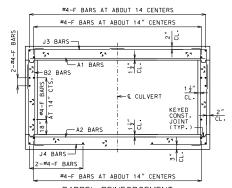




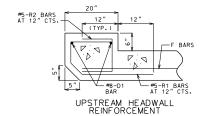


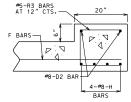


DOWNSTREAM WINGS REINFORCEMENT



BARREL REINFORCEMENT FOR DESIGN FILLS 2'-0" OR LESS





DOWNSTREAM HEADWALL REINFORCEMENT

GENERAL NOTES:

FOR MEMBER THICKNESS AND FOR BAR SIZES, SPACING AND DIMENSIONS OF ALL REINFORCEMENT EXCEPT J5 BARS, SEE 703.37. FOR J5 BARS, SEE 703.37.

BARREL AND WINGS SECTIONS ARE SYMMETRICAL ABOUT AND NORMAL TO © CULVERT. HEADWALL SECTIONS ARE NORMAL TO LONG DIRECTION OF HEADWALL.

DRAWING NOT TO SCALE. FOLLOW DIMENSIONS.

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MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)



CONCRETE SINGLE BOX CULVERT

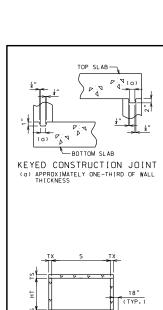
SKEW: RIGHT ADVANCE WINGS: FLARED

SECTIONS

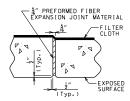
DATE EFFECTIVE: DATE PREPARED:

07/01/2015

703.15E



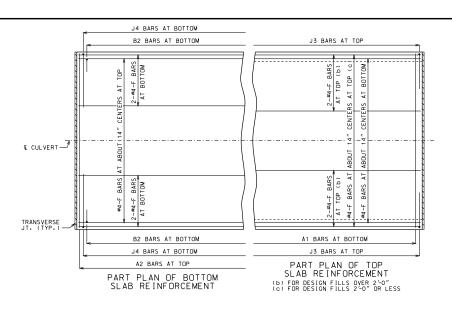
GRANULAR BACKFILL LIMITS
AND MEMBER DIMENSIONS

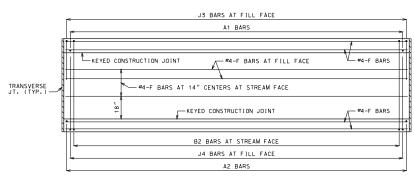


TRANSVERSE JOINT THRU BARREL

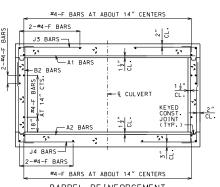
PREFORMED FIBER EXPANSION JOINT MATERIAL IN ACCORDANCE WITH SEC 1057 SHALL BE SECUPELY STITCHED TO ONE FACE OF THE CONCRETE WITH 10 GAGE COPPER WHEE OR 12 GAGE SOFT DRAWN GALVANIZED STEEL WHEE.

FILTER CLOTH 3 FEET IN WIDTH AND DOUBLE THICKNESS SHALL BE CENTERED ON TRANSVERSE JOINTS IN TOP SLAB AND SIDEWALLS WITH EDGES SEALED WITH MASTIC OR TWO SIDED TAREF. FILTER CLOTH SHALL BE A SUBSURFACE DRAINAGE GOTEXTIE IN ACCOPDANCE WAS A SUBSURFACE OF THE STATE OF

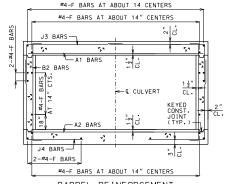




ELEVATION OF WALL REINFORCEMENT



BARREL REINFORCEMENT FOR DESIGN FILLS OVER 2'-0" SYMMETRICAL ABOUT AND NORMAL TO & CULVERT.



BARREL REINFORCEMENT FOR DESIGN FILLS 2'0" OR LESS SYMMETRICAL ABOUT AND NORMAL TO & CULVERT.

GENERAL NOTES

DESIGN SPECIFICATIONS: 2010 AASHTO LRFD BRIDGE DESIGN SPECFICATIONS AND 2010 INTERIM REVISIONS

DESIGN LOADING: YEHICULAR = HL-93 MINUS LANE LOAD, EARTH = 120 LB/CF EOUIVALENT FLUID PRESSURE = 30 LB/CF (MIN.), 60 LB/CF (MAX.)

DESIGN UNIT STRESSES: CLASS B-1 CONCRETE (BOX CULVERT) f'c = 4.000 PSI REINFORCING STEEL (GRADE 60) fy = 60.000 PSI MISCELLANEOUS: FOR MEMBER THICKNESS AND FOR BAR SIZES, SPACING AND DIMENSIONS, SEE 703.17.

CONSTRUCTION JOINT KEY NOT SHOWN FOR CLARITY IN PART PLANS AND ELEVATION.

DRAWING NOT TO SCALE. FOLLOW DIMENSIONS.

MINIMUM CLEARANCE TO REINFORCING STEEL SHALL BE 12

OF MISO DENSE IN THE PROPERTY OF THE PROPERTY

MODOT

CONCRETE SINGLE BOX CULVERT

MISSOURI HIGHWAYS AND TRANSPORTATION

105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)

CUT SECTION

DATE EFFECTIVE: <u>04/01/2011</u>
DATE PREPARED: <u>5/13/2015</u>

7<u>2011</u> 703

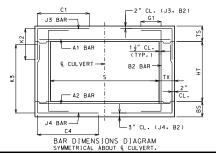
703.16

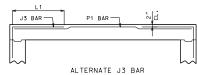
SHEET NO. 1 OF 1

COMMISSION

				SF	PAN ((S)	= 3	FT		HE	I GH 1	[(H]	Γ) =	2 F	T OR	3 FT				
		EMBE				TI	OP SL	AB BARS	S				BOT	TOM SI	AB BAI	₹\$		₩AL	L BAF	RS.
DESIGN	TH	CKME	ESS	A1	BARS			J3 BA	RS		A2	BARS			J4 BAI	RS		Ba	2 BARS	5
FILL	TS	BS	ТX	SIZE	SPA.	SIZE	SPA.	C1	HT=2'	2 HT=3'	SIZE	SPA.	SIZE	SPA.	C4		3 HT=3'	SIZE	SPA.	G1
1 FT	9	8	8	4	7	4	12	32.5	25.3	33.6	4	11.5	4	12	32.5	28	40	5	12	12
2 FT	9	8	8	4	7	4	12	32.5	25.3	33.6	4	11.5	4	12	30.8	28	40	5	12	12
4 FT	8	8	8	4	12	4	12	26.4	24.1	32.4	4	12	4	12	26.0	28	40	5	12	0
6 FT	8	8	8	4	12	4	12	24.6	24.1	32.4	4	12	4	12	24.6	28	40	5	12	0
8 FT	8	8	8	4	12	4	12	23.8	24.1	32.4	4	12	4	12	23.8	28	40	5	12	0
10 FT	8	8	8	4	12	4	12	22.0	24.1	32.4	4	12	4	12	22.0	28	40	5	12	0
12 FT	8	8	8	4	12	4	12	22.0	24.1	32.4	4	12	4	12	22.0	28	40	5	12	0
14 FT	8	8	8	4	12	4	12	22.0	24.1	32.4	4	12	4	12	22.0	28	40	5	12	0
16 FT	8	8	8	4	12	4	12	22.0	24.1	32.4	4	12	4	12	22.0	28	40	5	12	0
18 FT	8	8	8	4	12	4	12	22.0	24.1	32.4	4	12	4	12	22.0	28	40	5	12	0
20 FT	8	8	8	4	12	4	12	22.0	24.1	32.4	4	11	4	12	22.0	28	40	5	12	0
22 FT	8	8	8	4	11.5	4	12	22.0	24.1	32.4	4	10	4	12	22.0	28	40	5	12	0
24 FT	8	8	8	4	10.5	4	12	22.0	24.1	32.4	4	9	4	12	22.0	28	40	5	12	0
26 FT	8	8	8	4	9.5	4	12	22.0	24.1	32.4	4	8.5	4	11.5	22.0	28	40	5	12	0
28 FT	8	8	8	4	9	4	11.5	22.0	24.1	32.4	4	8	4	10.5	22.0	28	40	5	12	0
30 FT	8	8	8	4	8.5	4	11	22.0	24.1	32.4	4	7.5	4	10	22.0	28	40	5	12	0
32 FT	8	8	8	4	8	4	10	22.0	24.1	32.4	4	7	4	9.5	22.0	28	40	5	12	0
34 FT	8	8	8	4	7.5	4	9.5	22.0	24.1	32.4	4	6.5	4	8.5	22.0	28	40	5	12	0
36 FT	8	8	8	4	7	4	9	22.0	24.1	32.4	4	6	4	8	22.0	28	40	5	12	0
38 FT	8	8	8	4	6.5	4	8.5	22.0	24.1	32.4	5	9	4	8	22.0	28	40	5	12	0
40 FT	8	9	8	4	6.5	4	8	22.0	24.1	32.1	4	6	4	11	21.5	29	41	5	12	0
42 FT	8	9	8	4	6	4	8	22.0	24.1	32.1	5	9	4	10	21.5	29	41	5	12	0
44 FT	8	9	8	4	6	4	7.5	22.0	24.1	32.1	5	8.5	4	10	21.5	29	41	5	12	0
46 FT	8	9	8	4	6	4	7	22.0	24.1	32.1	5	8	4	9.5	21.5	29	41	5	12	0
48 FT	8	10	8	4	6	4	7	22.0	24.0	31.9	5	8.5	4	12	21.5	30	42	5	12	0
50 FT	8	10	8	4	6	4	6.5	22.0	24.0	31.9	5	8	4	12	21.5	30	42	5	12	0

				SF	PAN	(S)	= 3	FT		HE	I GH	L (H.	Γ) =	: 4 F	T OR	5 FT				\equiv
	М	EMBE	R			TO	OP SL	AB BARS	S				BOT	TOM SI	AB BAI	RS		₩AI	L BAI	₹S
DESIGN	TH	CKN	ESS	A1	BARS			J3 BA	RS		A2	BARS			J4 BAI	RS		В:	2 BAR	5
FILL	TS	BS	тх	SIZE	SPA.	SIZE	SPA.	C1	HT=4'	2 HT=5'	SIZE	SPA.	SIZE	SPA.	C4		3 HT=5'	SIZE	SPA.	G1
1 FT	9	8	8	4	6.5	4	12	32.5	25.3	30.3	4	10.5	4	12	32.5	52	64	5	12	12
2 FT	9	8	8	4	6.5	4	12	32.5	25.3	30.3	4	10	4	12	32.5	52	64	5	12	12
4 FT	8	8	8	4	12	4	12	32.5	24.3	29.1	4	12	4	12	32.5	52	64	5	12	0
6 FT	8	8	8	4	12	4	12	36.1	24.3	29.1	4	12	4	12	33.5	52	64	5	12	0
8 FT	8	8	8	4	12	4	12	32.5	24.3	29.1	4	12	4	12	32.5	52	64	5	12	0
10 FT	8	8	8	4	12	4	12	32.5	24.3	29.1	4	12	4	12	32.5	52	64	5	12	0
12 FT	8	8	8	4	12	4	12	35.6	24.3	29.1	4	12	4	12	32.5	52	64	5	12	0
14 FT	8	8	8	4	12	4	12	34.4	24.3	29.1	4	12	4	11.5	36.1	52	64	5	12	0
16 FT	8	8	8	4	12	4	12	33.5	24.3	29.1	4	12	4	11	35.3	52	64	5	12	0
18 FT	8	8	8	4	12	4	12	32.5	24.3	29.1	4	12	4	10.5	34.8	52	64	5	12	0
20 FT	8	8	8	4	12	4	12	31.6	24.3	29.1	4	10.5	4	10	34.4	52	64	5	12	0
22 FT	8	8	8	4	11.5	4	11	31.6	24.3	29.1	4	9.5	4	9.5	33.9	52	64	5	12	0
24 FT	8	8	8	4	10.5	4	10	31.6	24.3	29.1	4	9	4	9	33.9	52	64	5	12	0
26 FT	8	8	8	4	9.5	4	9.5	31.3	24.3	29.1	4	8.5	4	8	33.5	52	64	5	12	0
28 FT	8	8	8	4	9	4	8.5	31.3	24.3	29.1	4	7.5	4	7.5	33.0	52	64	5	12	0
30 FT	8	8	8	4	8.5	4	8	31.3	24.3	29.1	4	7	4	7	33.0	52	64	5	12	0
32 FT	8	8	8	4	8	4	7.5	30.8	24.3	29.1	4	7	4	6.5	33.0	52	64	5	12	0
34 FT	8	8	8	4	7.5	4	7	30.8	24.3	29.1	4	6.5	4	6.5	32.5	52	64	5	12	0
36 FT	8	8	8	4	7	4	7	30.8	24.3	29.1	4	6	4	6	32.5	52	64	5	12	0
38 FT	8	8	8	4	6.5	4	6.5	30.8	24.3	29.1	5	9	5	7	32.5	52	64	5	12	0
40 FT	8	9	8	4	6.5	4	6	30.8	24.0	28.8	4	6	4	6.5	32.5	53	65	5	12	0
42 FT	8	9	8	4	6	4	6	30.8	24.0	28.8	5	9	4	6	32.5	53	65	5	11.5	0
44 FT	8	9	8	4	6	5	6.5	30.8	24.0	28.8	5	8.5	4	6	32.5	53	65	5	11	0
46 FT	8	9	8	4	6	5	6.5	30.4	24.0	28.8	5	8	5	6.5	34.8	53	65	5	10.5	0
48 FT	8	9	8	4	6	5	6	30.4	24.0	28.8	5	8	5	6.5	34.8	53	65	5	10	0
50 FT	8	9	8	4	6	5	6	30.4	24.0	28.8	5	7.5	5	6	34.8	53	65	5	9.5	0





GENERAL NOTES:

IF DESIGN FILLES.

IF DESIGN FILLES.

FILE THE PROBLEM FI

SPECIAL DESIGNS ARE REQUIRED WHEN THE DESIGN FILL IS LESS THAN 1 FOOT OR GREATER THAN 50 FEET.

DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.

DESIGN FILLS ARE MEASURED FROM THE TOP OF TOP SLAB TO THE TOP OF EARTH FILL OR ROADWAY.

CULVERTS MEET STRENGTH AND SERVICEABILITY REQUIREMENTS FOR THE DESIGN VEHICULAR LIVE LOAD HL-93 MINUS THE LANE LOAD.



MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)



CONCRETE SINGLE BOX CULVERT

MEMBER THICKNESS BAR SIZE, SPACING & DIMENSIONS

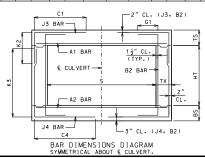
SPAN (S): 3 FEET HEIGHT (HT): 2 THRU 5 FEET

DATE EFFECTIVE: DATE PREPARED: 4/18/2011

703.17

					SF	PAN	(S)	= 4	FT		HE	I GH1	(H)	Γ) =	2 F	T OR	3 FT				
			EMBE				T(OP SL	AB BARS					BOT	TOM SI	AB BA			WAI		
DES		THI	CKN	ESS	A1	BARS			J3 BA	RS		A2	BARS			J4 BA	RS		B:	2 BAR	S
FI	LL	TS	BS	тх	SIZE	SPA.	SIZE	SPA.	C1	HT=2'	2 HT=3'	SIZE	SPA.	SIZE	SPA.	C4		3 HT=3'	SIZE	SPA.	G1
1	FT	10	8	8	4	6	4	10.5	38.6	26.3	34.8	4	7	4	7	30.3	28	40	5	12	12
2	FΤ	10	8	8	4	6	4	10.5	38.6	26.3	34.8	4	7	4	7	28.0	28	40	5	12	12
4	FΤ	8	8	8	4	12	4	12	25.3	24.1	32.4	4	11	4	12	25.3	28	40	5	12	0
6	FT	8	8	8	4	12	4	12	24.6	24.1	32.4	4	12	4	12	24.6	28	40	5	12	0
8	FT	8	8	8	4	12	4	12	24.1	24.1	32.4	4	12	4	12	24.1	28	40	5	12	0
10	FT	8	8	8	4	12	4	12	23.0	24.1	32.4	4	12	4	12	23.0	28	40	5	12	0
	FT	8	8	8	4	12	4	12	23.0	24.1	32.4	4	11	4	12	23.0	28	40	5	12	0
	FT	8	8	8	4	11	4	12	23.0	24.1	32.4	4	9.5	4	11.5	23.0	28	40	5	12	0
	FT	8	8	8	4	10	4	11	23.0	24.1	32.4	4	8.5	4	10	23.0	28	40	5	12	0
	FT	8	8	8	4	8.5	4	10	23.0	24.1	32.4	4	7.5	4	9	22.4	28	40	5	12	0
	FΤ	8	8	8	4	8	4	9	23.0	24.1	32.4	4	6.5	4	8	22.4	28	40	5	12	0
	FT	8	8	8	4	7	4	8	23.0	24.1	32.4	4	6	4	7.5	22.4	28	40	5	12	0
	FT	8	8	8	4	6.5	4	7.5	23.0	24.1	32.4	5	8.5	4	6.5	22.4	28	40	5	12	0
	FT	8	8	8	4	6	4	7	23.0	24.1	32.4	5	8	4	6	22.4	28	40	5	12	0
	FT	8	9	8	4	6	4	6.5	23.0	24.1	32.1	5	8	4	8	21.9	29	41	5	12	0
	FT	8	9	8	4	6	4	6	23.0	24.1	32.1	5	7.5	4	7.5	21.9	29	41	5	12	0
	FT	8	10	8	4	6	5	6.5	23.0	24.0	31.9	5	7.5	4	10	21.3	30	42	5	12	0
	FT	9	10	8	5	8.5	4	7	22.4	25.1	33.0	5	7.5	4	9.5	21.3	30 30	42	5	12	0
	FT	9	10	8	5	8.5	4	6.5	22.4	25.4	33.0	5	7	4	9	21.3	31	42	5	12	0
	FT	9	11	8	5	8.5	4	6	22.4	25.4	33.1	5	6.5	4	10	20.8	31	43	5	12	0
	FT	10	11	8	5	8	4	7	21.9	26.0	33.8	5	6.5	4	9.5	21.3	31	43	5	12	0
	FT	10	11	8	5	8	4	6.5	21.9	26.0	33.8	5	6.5	4	8.5	21.3	31	43	5	12	0
46		10	12	8	5	8	4	6.5	21.9	26.3	33.9	5	6	4	9.5	20.8	32	44	5	12	0
	FT	10	12	8	5	8	4	6	21.9	26.3	33.9	5	6	4	9.5	20.8	32	44	5	12	0
50		11	12	8	5	7.5	4	7	21.3	27.3	35.1	5	6	4	9.5	21.3	32	44	5	12	0
100		- 1	1.2		1 2	1.0	<u> </u>		21.3	121.3	77.1		_ 0_		3.3	21.3	1 22	1 44	1 2	1 . 2	1 0

				SF	PAN	(S)	= 4	FT		HE	I GH 1	(H)	Γ) =	6 F	T OR	7 FT				\neg
		EMBE				T	OP SLA	AB BARS	S				BOT:	TOM SI	LAB BAI	₹S		₩AL	L BAF	₹S
DESIGN	TH	CKNE	ESS	A1	BARS			J3 BA			Α2	BARS			J4 BAI	RS		Ba	BARS	3
FILL	TS	BS	ТХ	SIZE	SPA.	SIZE	SPA.	C1	HT=6'	2 HT=7'	SIZE	SPA.	SIZE	SPA.	C4	HT=6'		SIZE	SPA.	G1
1 FT	10	8	8	5	8.5	4	10.5	38.6	26.4	30.1	5	9	4	7	38.6	76	88	5	12	12
2 FT	10	8	8	5	8.5	4	10.5	38.6	26.4	30.1	5	8.5	4	6.5	38.6	76	88	5	12	12
4 FT	8	8	8	4	11	4	11	38.6	24.1	27.5	4	9	4	8	38.6	76	88	5	12	0
6 FT	8	8	8	4	12	4	11	38.6	24.1	27.5	4	10.5	4	7	38.6	76	88	5	12	0
8 FT	8	8	8	4	12	4	10	38.6	24.1	27.5	4	10.5	4	7	38.6	76	88	5	12	0
10 FT	8	8	8	4	12	4	11	38.6	24.1	27.5	4	11	4	7	38.6	76	88	5	12	0
12 FT	8	8	8	4	12	4	9.5	38.6	24.1	27.5	4	10	4	6.5	38.6	76	88	5	12	0
14 FT	8	8	8	4	10.5	4	8	38.6	24.1	27.5	4	8.5	4	- 6	38.6	76	88	5	12	0
16 FT	8	9	8	4	9.5	4	7	38.6	24.4	27.9	4	8.5	4	6.5	38.6	77	89	5	12	0
18 FT	8	9	8	4	8.5	4	6.5	38.6	24.4	27.9	4	7.5	4	6	38.6	77	89	5	12	0
20 FT	8	10	8	4	8	4	6	38.6	24.6	28.1	4	7.5	4	6	40.9	78	90	5	11.5	0
22 FT	8	10	9	4	7.5	4	6.5	40.5	24.6	28.1	4	7	4	7	39.9	78	90	5	11.5	0
24 FT	8	10	9	4	7	4	6	39.9	24.6	28.1	4	6.5	4	6.5	39.9	78	90	5	11	0
26 FT	8	10	9	4	6.5	5	6.5	39.4	24.6	28.1	4	6	4	6	39.9	78	90	5	10	0
28 FT	8	10	9	4	6	5	6	38.8	24.6	28.1	5	9	5	7	41.6	78	90	5	9.5	0
30 FT	8	10	9	4	6	6	7.5	41.0	24.6	28.1	5	8.5	5	6.5	41.6	78	90	5	9	0
32 FT	8	10	9	4	6	6	7	40.5	24.6	28.1	5	8	5	6	41.6	78	90	5	8.5	0
34 FT	9	11	9	5	8.5	5	6	41.6	26.1	29.8	5	8.5	5	6	41.6	79	91	5	8.5	0
36 FT	9	11	9	5	8.5	5	6	41.6	26.1	29.8	5	8	5	6	41.6	79	91	5	8.5	0
38 FT	9	11	9	5	8.5	5	6	41.6	26.1	29.8	5	7.5	6	7	43.9	79	91	5	8.5	0
40 FT	9	11	9	5	8.5	5	6	41.6	26.1	29.8	5	7	6	7	43.9	79	91	5	8.5	0
42 FT	10	11	9	5	8	5	6	41.6	30.8	35.0	5	7	6	6.5	43.9	79	91	5	8.5	0
44 FT	10	11	9	5	8	5	6	41.6	30.8	35.0	5	6.5	6	6.5	43.9	79	91	5	8.5	0
46 FT	10	11	10	5	8	5	6.5	42.9	26.4	30.0	5	6.5	5	6	42.9	79	91	5	8	0
48 FT	10	11	10	5	8	5	6.5	42.9	30.8	35.0	5	6	6	7.5	44.6	79	91	5	8	0
50 FT	11	12	11	5	7.5	5	7	44.3	27.9	31.6	5	6.5	5	7.5	43.6	80	92	5	7.5	0



				SF	PAN	(S)	= 4	FT		HE	I GH1	(H	Γ) =	4 F	T OR	5 FT				
	L M	EMBE	D			TI	DP SLA	AB BARS	S				BOT	TOM SI	AB BAI	RS		WΔI	LL BAF	₹5
DESIGN		CKN		Δ1	BARS			J3 BA			A2	BARS			J4 BAI				2 BARS	
FILL					Ē					2						l ĸ	3			
	TS	BS	TX	SIZE	SPA.	SIZE	SPA.	C1	HT=4'	HT=5'	SIZE	SPA.	SIZE	SPA.	C4	HT=4'		SIZE	SPA.	G1
1 FT	10	8	8	5	9	4	10.5	38.6	26.3	31.4	4	6	4	8	38.6	52	64	5	12	12
2 FT	10	8	8	5	9	4	10.5	38.6	26.3	31.4	4	6	4	7.5	38.6	52	64	5	12	12
4 FT	8	8	8	4	11.5	4	12	38.6	24.3	29.1	4	9.5	4	11.5	38.6	52	64	5	12	0
6 FT	8	8	8	4	12	4	12	35.9	24.3	29.1	4	11	4	11.5	35.3	52	64	5	12	0
8 FT	8	8	8	4	12	4	12	32.5	24.3	29.1	4	11	4	11	32.5	52	64	5	12	0
10 FT	8	8	8	4	12	4	12	28.0	24.3	29.1	4	11.5	4	11.5	28.0	52	64	5	12	0
12 FT	8	8	8	4	12	4	12	27.5	24.3	29.1	4	10	4	10.5	28.0	52	64	5	12	ō
14 FT	8	8	8	4	10.5	4	12	27.5	24.3	29.1	4	9	4	10	27.5	52	64	5	12	0
16 FT	8	8	8	4	9.5	4	11	26.9	24.3	29.1	4	8	4	9.5	27.5	52	64	5	12	0
18 FT	8	8	8	4	8.5	4	9.5	26.9	24.3	29.1	4	7	4	8.5	27.5	52	64	5	12	0
20 FT	8	8	8	4	7.5	4	9	26.9	24.3	29.1	4	6.5	4	7.5	27.5	52	64	5	12	0
22 FT	8	8	8	4	7	4	8	26.9	24.3	29.1	4	6	4	7	27.5	52	64	5	12	0
24 FT	8	8	8	4	6	4	7.5	26.9	24.3	29.1	5	8.5	4	6.5	26.9	52	64	5	12	0
26 FT	8	8	8	4	6	4	6.5	26.9	24.3	29.1	5	8	4	6	26.9	52	64	5	12	0
28 FT	8	9	8	4	6	4	6	26.9	24.0	28.8	5	8	4	7.5	27.5	53	65	5	12	0
30 FT	8	9	8	4	6	4	6	26.9	24.0	28.8	5	7.5	4	7	27.5	53	65	5	12	0
32 FT	8	9	8	4	6	5	6.5	26.9	24.0	28.8	5	7.5	4	6.5	27.5	53	65	5	12	0
34 FT	9	10	8	5	8.5	4	6.5	26.9	25.4	30.4	5	7	4	7.5	28.0	54	66	5	12	0
36 FT	9	10	8	5	8.5	4	6	26.9	25.4	30.4	5	7	4	7	28.0	54	66	5	12	0
38 FT	9	10	8	5	8.5	5	7	26.9	25.4	30.4	5	7	4	7	28.0	54	66	5	12	0
40 FT	9	11	8	5	8.5	5	6.5	26.9	25.3	30.0	5	6.5	4	7	28.5	55	67	5	12	0
42 FT	10	11	8	5	8	5	7.5	27.5	26.3	31.1	5	6.5	4	6.5	28.5	55	67	5	12	0
44 FT	10	11	8	5	8	5	7.5	27.5	26.3	31.1	5	6.5	4	6	28.5	55	67	5	12	0
46 FT	10	11	8	5	8	5	7.5	27.5	26.3	31.1	5	6.5	4	6	28.5	55	67	5	12	0
48 FT	10	12	8	5	8	5	7.5	27.5	26.0	30.8	5	6	4	6	29.1	56	68	5	11.5	0
50 FT	11	12	8	5	7.5	5	8	28.0	27.0	32.0	5	6	4	6	29.1	56	68	5	11	0

GENERAL NOTES:

IF DESIGN FILLES.

IF DESIGN FILLES.

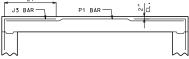
FILE THE PROBLEM FI

SPECIAL DESIGNS ARE REQUIRED WHEN THE DESIGN FILL IS LESS THAN 1 FOOT OR GREATER THAN 50 FEET.

DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.

DESIGN FILLS ARE MEASURED FROM THE TOP OF TOP SLAB TO THE TOP OF EARTH FILL OR ROADWAY.

CULVERTS MEET STRENGTH AND SERVICEABILITY REQUIREMENTS FOR THE DESIGN VEHICULAR LIVE LOAD HL-93 MINUS THE LANE LOAD.



ALTERNATE J3 BAR



MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)



CONCRETE SINGLE BOX CULVERT

MEMBER THICKNESS BAR SIZE, SPACING & DIMENSIONS

SPAN (S): 4 FEET HEIGHT (HT): 2 THRU 7 FEET

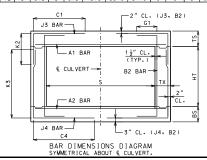
DATE EFFECTIVE: DATE PREPARED:

4/18/2011

703.17

				SF	PAN	(S)	= 5	FT		HE	I GH1	(H)	Γ) =	3 F	T OR	4 FT				
		EMBE				T(DP SL	AB BARS	5				BOT	roM si	AB BAI	₹S		WAL	L BAI	RS
DESIGN	TH	CKNE	SS	A1	BARS			J3 BA			A2	BARS			J4 BAI			Ba	BAR:	5
FILL	TS	BS	ТX	SIZE	SPA.	SIZE	SPA.	C1	HT=3'	2 HT=4'	SIZE	SPA.	SIZE	SPA.	C4	HT=3'	3 HT=4'	SIZE	SPA.	G1
1 FT	10	8	8	5	8	4	10.5	44.9	26.5	33.0	5	8.5	4	6	35.4	40	52	5	12	12
2 FT	10	8	8	5	8	4	10.5	44.9	26.5	33.0	5	8	4	6	32.0	40	52	5	12	12
4 FT	8	8	8	4	8.5	4	10.5	28.5	24.5	30.6	4	7.5	4	10	28.5	40	52	5	12	0
6 FT	8	8	8	4	10	4	12	27.3	24.5	30.6	4	8	4	10	27.3	40	52	5	12	0
8 FT	8	8	8	4	9.5	4	11	26.5	24.5	30.6	4	8	4	9.5	26.5	40	52	5	12	0
10 FT	8	8	8	4	10	4	12	25.1	24.5	30.6	4	8.5	4	10.5	25.1	40	52	5	12	0
12 FT	8	8	8	4	8.5	4	10	25.1	24.5	30.6	4	7	4	9	25.1	40	52	5	12	0
14 FT	8	8	8	4	7.5	4	8.5	25.1	24.5	30.6	4	6	4	7.5	25.1	40	52	5	12	0
16 FT	8	8	8	4	6.5	4	7.5	25.1	24.5	30.6	5	8.5	4	7	25.1	40	52	5	12	0
18 FT	8	8	8	4	6	4	6.5	25.1	24.5	30.6	5	8	4	6	25.1	40	52	5	12	0
20 FT	8	8	8	4	6	4	6	25.1	24.5	30.6	5	8	5	6.5	25.1	40	52	5	12	0
22 FT	8	9	8	4	6	5	6.5	25.1	24.0	30.0	5	7.5	4	7	23.8	41	53	5	12	0
24 FT	8	9	8	4	6	5	6	25.1	24.0	30.0	5	7.5	4	6.5	23.8	41	53	5	12	0
26 FT	9	10	8	5	8.5	4	6.5	24.5	25.0	31.0	5	7	4	8.5	23.8	42	54	5	12	0
28 FT	9	10	8	5	8.5	4	6	24.5	25.0	31.0	5	7	4	8	23.8	42	54	5	12	0
30 FT	9	11	8	5	8	5	6.5	24.5	25.5	31.5	5	6.5	4	9	23.1	43	55	5	12	0
32 FT	10	11	8	5	8	4	6	23.8	26.0	32.0	5	6.5	4	8	23.1	43	55	5	12	0
34 FT	10	12	8	5	7.5	5	7.5	23.8	26.5	32.5	5	6	4	9	22.5	44	56	5	12	0
36 FT	10	12	8	5	7	5	7.5	23.8	26.5	32.5	5	6	4	8.5	22.5	44	56	5	12	0
38 FT	11	12	8	5	7	4	6	23.8	27.0	33.0	5	6	4	8	23.1	44	56	5	12	0
40 FT	11	13	8	5	6.5	5	8.5	23.8	27.5	33.5	5	6	4	8.5	22.5	45	57	5	12	0
42 FT	12	13	8	5	6.5	4	6	23.1	28.0	34.0	5	6	4	8	23.1	45	57	5	12	0
44 FT	12	13	8	5	6.5	5	9	23.1	28.0	34.0	5	6	4	7.5	23.1	45	57	5	12	0
46 FT	12	14	8	5	6	5	8.5	23.8	28.5	34.5	6	8	4	7.5	22.5	46	58	5	12	0
48 FT	13	14	8	5	6	4	6	23.1	29.0	35.0	6	8	4	7.5	23.1	46	58	5	12	0
50 FT	13	14	8	5	6	5	8.5	23.1	29.0	35.0	6	8	4	7.5	23.1	46	58	5	12	0

				SF	PAN ((S)	= 5	FT		HE	I GH 1	L (H,	T) =	: 7 F	T OR	8 FT				
		EMBE				T (OP SL	AB BARS	3				BOT	TOM SI	LAB BAI	₹\$		₩AL	L BAF	₹S
DESIGN	TH:	CKNE	ESS	A1	BARS			J3 BA	RS		Α2	BARS			J4 BAI	RS		Ba	2 BARS	5
FILL	TS	BS	ТХ	SIZE	SPA.	SIZE	SPA.	C1	HT=7'	2 HT=8'	SIZE	SPA.	SIZE	SPA.	C4	HT=7'	3 HT=8'	SIZE	SPA.	G1
1 FT	10	9	8	5	8	4	9.5	44.9	26.5	29.8	5	7.5	4	7	44.9	89	101	5	12	12
2 FT	10	9	8	5	8	4	8.5	44.9	26.5	29.8	5	7.5	4	6.5	44.9	89	101	5	12	12
4 FT	8	8	8	4	7.5	4	7.5	44.9	24.8	27.9	4	6.5	4	6	44.9	88	100	5	12	0
6 FT	8	9	8	4	9	4	7.5	44.9	24.0	27.0	4	7.5	4	6.5	44.9	89	101	5	12	0
8 FT	8	9	8	4	9	4	7	44.9	24.0	27.0	4	7.5	4	6	44.9	89	101	5	12	0
10 FT	8	9	8	4	10	4	7.5	44.9	24.0	27.0	4	8	4	6.5	44.9	89	101	5	12	0
12 FT	8	10	8	4	8.5	4	6.5	44.9	24.3	27.3	4	8	4	6.5	44.9	90	102	5	12	0
14 FT	8	10	9	4	7.5	4	6.5	41.4	24.3	27.3	4	7	4	7	45.5	90	102	5	12	0
16 FT	8	10	9	4	6.5	4	6	40.8	24.3	27.3	4	6	4	6.5	45.5	90	102	5	11.5	0
18 FT	8	10	9	4	6	5	6.5	40.0	24.3	27.3	5	9	4	6	45.5	90	102	5	10.5	0
20 FT	8	10	9	4	6	5	6	39.4	25.3	28.4	5	8	5	6.5	47.6	90	102	5	10	0
22 FT	8	10	9	4	6	6	7	42.1	25.3	28.4	5	7.5	5	6	47.6	90	102	5	9	0
24 FT	9	11	9	5	8.5	5	6	41.4	26.8	30.0	5	7.5	5	6	47.6	91	103	5	8.5	0
26 FT	9	11	9	5	8.5	5	6	41.4	26.8	30.0	5	7	6	7.5	49.6	91	103	5	8.5	0
28 FT	9	11	9	5	8.5	5	6	41.4	29.8	33.3	5	6.5	6	7	49.6	91	103	5	8.5	0
30 FT	9	11	9	5	8	5	6	40.8	29.8	33.3	5	6.5	6	6.5	49.6	91	103	5	8.5	0
32 FT	10	11	9	5	8	5	6	46.3	30.0	33.6	5	6.5	6	6	49.6	91	103	5	8.5	0
34 FT	10	11	9	5	7.5	5	6	45.5	30.0	33.6	5	6	6	- 6	49.6	91	103	5	8.5	0
36 FT	10	12	10	5	7	5	6.5	40.6	30.3	33.9	5	6	5	6	49.0	92	104	5	8	0
38 FT	11	12	10	5	7.5	5	6	43.4	31.6	35.4	5	6	6	7	51.1	92	104	5	8	0
40 FT	11	12	11	5	7.5	5	7	41.1	31.6	35.4	5	6	5	6.5	49.8	92	104	5	7.5	0
42 FT	11	13	11	5	7	5	7	41.1	31.9	35.6	5	6	5	6.5	49.8	93	105	5	7.5	0
44 FT	12	13	11	5	7	5	6.5	43.3	32.3	36.0	5	6	5	6	49.8	93	105	5	7.5	0
46 FT	12	13	11	5	7	5	6	43.3	32.3	36.0	5	6	5	6	49.8	93	105	5	7.5	0
48 FT	12	14	12	5	6.5	5	6.5	41.0	32.5	36.3	6	8	5	6.5	51.1	94	106	5	7	0
50 FT	13	14	12	5	6.5	5	6.5	43.3	33.9	37.8	6	8	5	6.5	51.1	94	106	5	7	0



				SF	PAN	(S)	= 5	FT		HE	I GH	(H.	Γ) =	5 F	T OR	6 FT				
		EMBE				TO	OP SLA	AB BARS	3				BOT	TOM SI	AB BA	RS		WAI	LL BAI	RS
DESIGN	TH	CKME	SS	A1	BARS			J3 BA	RS		A2	BARS			J4 BA	RS		B	2 BAR	S
FILL	TS	BS	ТX	SIZE	SPA.	SIZE	SPA.	C1	HT=5′	2 HT=6'	SIZE	SPA.	SIZE	SPA.	C4		3 HT=6'	SIZE	SPA.	G1
1 FT	10	8	8	5	8	4	10.5	44.9	26.3	30.6	5	8	4	6	44.9	64	76	5	12	12
2 FT	10	8	8	5	8	4	10.5	44.9	26.3	30.6	5	8	4	6	44.9	64	76	5	12	12
4 FT	8	8	8	4	8	4	11	44.9	24.1	28.3	4	7	4	8.5	44.9	64	76	5	12	0
6 FT	8	8	8	4	9	4	10.5	39.5	24.1	28.3	4	7.5	4	8	38.1	64	76	5	12	0
8 FT	8	8	8	4	9	4	10	34.6	24.1	28.3	4	7	4	7.5	34.6	64	76	5	12	0
10 FT	8	8	8	4	9.5	4	11	30.6	24.1	28.3	4	8	4	8	30.6	64	76	5	12	0
12 FT	8	8	8	4	8	4	9	29.9	24.1	28.3	4	6.5	4	7.5	30.6	64	76	5	12	0
14 FT	8	8	8	4	7	4	8	29.9	24.1	28.3	4	6	4	6.5	29.9	64	76	5	12	0
16 FT	8	8	8	4	6	4	7	29.3	24.1	28.3	5	8	4	6	29.9	64	76	5	12	0
18 FT	8	8	8	4	6	4	6	29.3	24.1	28.3	5	8	5	6.5	29.9	64	76	5	12	0
20 FT	8	8	8	4	6	5	6.5	29.3	24.1	28.3	5	8	5	6	29.9	64	76	5	12	0
22 FT	8	9	8	4	6	5	6	29.3	24.5	28.5	5	7.5	4	6	29.9	65	77	5	12	0
24 FT	8	9	8	5	9	6	7.5	32.0	28.1	32.8	5	7.5	5	6.5	29.9	65	77	5	12	0
26 FT	9	10	8	5	8.5	5	6.5	29.3	25.1	29.3	5	7	4	6	30.6	66	78	5	12	0
28 FT	9	10	8	5	8	5	6.5	29.3	25.1	29.3	5	7	5	7	29.9	66	78	5	12	0
30 FT	9	10	8	5	7.5	5	6.5	29.3	29.6	34.4	5	6.5	5	6.5	29.9	66	78	5	12	0
32 FT	10	11	8	5	7.5	5	7	29.3	26.6	30.8	5	6.5	5	7.5	30.6	67	79	5	12	0
34 FT	10	11	8	5	7.5	5	6.5	29.3	26.6	30.8	5	6.5	5	7	30.6	67	79	5	11.5	0
36 FT	10	11	8	5	7	5	6.5	29.3	30.4	35.3	5	6	5	6	30.6	67	79	5	11	0
38 FT	11	12	8	5	7	5	7	29.9	27.3	31.5	5	6	5	7	31.3	68	80	5	10	0
40 FT	11	12	8	5	6.5	5	6.5	29.9	31.3	36.0	5	6	5	6.5	31.3	68	80	5	10	0
42 FT	11	13	8	5	6.5	5	6	29.9	27.6	31.9	5	6	5	7	31.3	69	81	5	9.5	0
44 FT	12	13	8	5	6.5	5	6.5	29.9	28.0	32.3	5	6	5	6.5	32.0	69	81	5	9.5	0
46 FT	12	13	8	5	6	5	6	29.9	32.0	36.8	5	6	5	6	31.3	69	81	5	9.5	0
48 FT	12	14	9	5	6	5	7	30.4	28.4	32.5	6	8	5	8	31.8	70	82	5	9.5	0
50 FT	13	14	9	5	6	5	7.5	30.4	29.5	33.9	6	8	5	7.5	32.4	70	82	5	9	0

GENERAL NOTES:

IF DESIGN FILLES.

IF DESIGN FILLES.

FILE THE PROBLEM FI

SPECIAL DESIGNS ARE REQUIRED WHEN THE DESIGN FILL IS LESS THAN 1 FOOT OR GREATER THAN 50 FEET.

DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.

DESIGN FILLS ARE MEASURED FROM THE TOP OF TOP SLAB TO THE TOP OF EARTH FILL OR ROADWAY.

CULVERTS MEET STRENGTH AND SERVICEABILITY REQUIREMENTS FOR THE DESIGN VEHICULAR LIVE LOAD HL-93 MINUS THE LANE LOAD.



ALTERNATE J3 BAR

ALTERNATE J3 BAR AT CONTRACTOR'S OPTION. ALTERNATE J3 BARS MAY BE USED WHEN THE DISTANCE BETWEEN THE ENDS OF J3 BARS IN THE TOP SLAB IS LESS THAN 2 -0 "OF DIMENSION L1 IN THE TOP SLAB IS LESS THAN 2 -0 "OF DIMENSION L1 IN THE STAND SAY FOR "44. "5 AND "68 BARS. RESPECTIVELY. ADDITIONAL PIB BARS ARE REQUIRED WITH ALTERNATE J3 BARS WITH LENGTH EDUAL TO J1 BARS. AND STEAM AND SAY BARS ARE EQUIRED WITH ALTERNATE J3 BARS WITH LENGTH BARS. AND ADDITIONAL PLANT OF SAY BARS. NO ADDITIONAL PAYMENT WILL BE MADE FOR THIS SUBSTITUTION.



MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)



MEMBER THICKNESS BAR SIZE, SPACING & DIMENSIONS NUMBER PE-27/41 THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

SPAN (S): 5 FEET HEIGHT (HT): 3 THRU 8 FEET

DATE EFFECTIVE: DATE PREPARED:

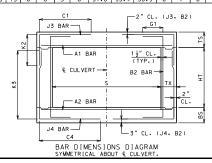
4/18/2011

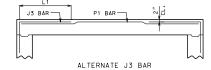
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				- 5	PAN	(S)	= 6			HE	IGHT	(HT) =	3 F	T OR	4 FT		5 FT				
		EMBE					TOP	SLAB E	BARS						вотто	/ SLAB	BARS			₩AL		
DESIGN	TH	CKN	ESS	A1	BARS			J3	BARS			A2	BARS			J4	BARS			Ba	2 BARS	ŝ
FILL	TS	BS	тх	SIZE	SPA.	SIZE	SPA.	C1		K2		SIZE	SPA.	SIZE	SPA.	C4		К3		SIZE	SPA.	G1
						JILL			HT=3'	HT=4'	HT=5'					• •	HT=3'		HT=5'			
1 FT	10	8	8	5	8	4	9	51.3	26.5	33.0	39.4	5	8	5	6	41.6	40	52	64	5	12	12
2 FT	11	8	8	5	7.5	4	9.5	51.3	27.0	33.5	40.0	5	8	6	7.5	36.0	40	52	64	5	12	12
4 FT	8	8	8	4	6.5	4	7.5	32.8	24.5	30.6	36.9	5	8.5	4	6.5	32.0	40	52	64	5	12	0
6 FT	8	8	8	4	7	4	8	30.4	24.5	30.6	36.9	5	9	4	7	30.4	40	52	64	5	12	0
8 FT	8	8	8	4	6.5	4	7.5	29.6	24.5	30.6	36.9	5	8.5	4	6.5	29.6	40	52	64	5	12	0
10 FT	8	8	8	4	7	4	8	27.3	24.5	30.6	36.9	4	6	4	7	27.3	40	52	64	5	12	0
12 FT	8	8	8	4	6	4	7	27.3	24.5	30.6	36.9	5	8	4	6	27.3	40	52	64	5	12	0
14 FT	8	8	8	4	6	4	6	27.3	24.5	30.6	36.9	5	8	5	6	27.3	40	52	64	5	12	0
16 FT	8	8	8	4	6	5	6	27.3	28.3	35.4	42.6	5	8	6	7	30.4	40	52	64	5	12	0
18 FT	8	9	8	5	8.5	6	7.5	30.4	24.0	30.0	36.0	5	7.5	4	6	26.4	41	53	65	5	12	0
20 FT	8	9	8	5	7.5	6	7.5	30.4	28.4	35.4	42.5	5	7	5	6.5	26.4	41	53	65	5	12	0
22 FT	9	10	8	5	7.5	5	6.5	26.4	25.0	31.0	37.0	5	7	4	6.5	25.6	42	54	66	5	12	0
24 FT	9	11	8	5	7	5	6.5	26.4	25.5	31.5	37.5	5	6.5	4	7	24.8	43	55	67	5	12	0
26 FT	10	11	8	5	7	5	7.5	26.4	26.0	32.0	38.0	5	6.5	4	6.5	25.6	43	55	67	5	12	0
28 FT	10	12	8	5	6.5	5	7.5	26.4	26.5	32.5	38.5	5	6	4	- 7	24.8	44	56	68	5	12	0
30 FT	11	12	8	5	6.5	5	8.5	25.6	27.0	33.0	39.0	5	6	4	6	24.8	44	56	68	5	12	0
32 FT	11	13	8	5	6	5	8	25.6	27.5	33.5	39.5	5	6	4	7	24.8	45	57	69	5	12	0
34 FT	12	13	8	5	6	5	8.5	25.6	28.0	34.0	40.0	5	6	4	6	24.8	45	57	69	5	12	0
36 FT	12	14	8	6	8	5	8.5	25.6	28.5	34.5	40.5	6	8	4	6.5	24.8	46	58	70	5	12	0
38 FT	13	14	8	6	8	5	8.5	24.8	29.0	35.0	41.0	6	8	4	6	24.8	46	58	70	5	12	0
40 FT	13	14	8	6	7.5	5	8.5	24.8	29.0	35.0	41.0	6	7.5	5	9	24.8	46	58	70	5	12	0
42 FT	14	15	8	6	8	5	8.5	24.8	30.0	36.0	42.0	6	7.5	4	6	24.8	47	59	71	5	12	0
44 FT	14	15	8	6	7.5	5	8.5	24.8	30.0	36.0	42.0	6	7.5	5	8.5	24.8	47	59	71	5	12	0
46 FT	14	16	8	6	7	5	8.5	24.8	30.5	36.5	42.5	6	7	4	6	24.8	48	60	72	5	12	0
48 FT	15	16	8	6	7	5	8	29.6	31.0	37.0	43.0	6	7	5	8	25.6	48	60	72	5	12	0
50 FT	15	16	8	6	7	5	8	29.6	31.0	37.0	43.0	6	7	5	8	24.8	48	60	72	5	12	0

				SF	PAN	(S)	= 6	FT		HE	I GH 1	(H)	Γ) =	= 6 F	T OR	7 FT				$\overline{}$
	М	EMBE	R			T	DP SL	AB BARS	3				BOT	TOM SI	AB BAI	RS		₩AI	LL BAF	₹S
DESIGN	TH:	CKN	ESS	A1	BARS			J3 BA			A2	BARS			J4 BAI	RS		B	2 BARS	5
FILL	TS	вѕ	ТX	SIZE	SPA.	SIZE	SPA.	C1	HT=6'	2 HT=7'	SIZE	SPA.	SIZE	SPA.	C4		3 HT=7'	SIZE	SPA.	G1
1 FT	10	8	8	5	8	4	9.5	51.3	26.4	30.1	5	8	5	6	52.8	76	88	5	12	12
2 FT	11	9	8	5	7.5	4	9.5	51.3	27.9	31.6	5	7.5	4	6.5	51.3	77	89	5	12	12
4 FT	8	8	8	4	6	4	7	51.3	24.1	27.5	5	8	4	6	51.3	76	88	5	12	0
6 FT	8	8	8	4	6.5	4	7.5	42.4	24.1	27.5	5	8	4	6	41.6	76	88	5	12	0
8 FT	8	8	8	4	6.5	4	7	38.4	24.1	27.5	5	8	5	6.5	38.4	76	88	5	12	0
10 FT	8	8	8	4	7	4	7.5	32.8	24.1	27.5	5	8.5	4	6	33.6	76	88	5	12	0
12 FT	8	9	8	4	6	4	6	32.8	24.4	27.9	5	8	4	7	33.6	77	89	5	12	0
14 FT	8	9	8	4	6	5	6.5	32.0	24.4	27.9	5	7.5	4	6	32.8	77	89	5	12	0
16 FT	8	9	8	4	6	6	7.5	35.3	28.5	32.6	5	7.5	5	6.5	32.8	77	89	5	12	0
18 FT	8	9	8	5	8.5	6	7.5	34.4	28.5	32.6	5	7.5	6	7.5	35.3	77	89	5	12	0
20 FT	8	9	8	5	7.5	6	7.5	34.4	28.5	32.6	5	6.5	6	7	35.3	77	89	5	12	0
22 FT	9	10	8	5	7.5	5	6	32.0	25.8	29.4	5	7	5	6	32.8	78	90	5	12	0
24 FT	9	11	8	5	7	6	7	34.4	29.6	33.6	5	6.5	5	6.5	32.8	79	91	5	12	0
26 FT	10	11	8	5	6.5	5	6	32.0	30.8	35.0	5	6.5	5	6	32.8	79	91	5	11	0
28 FT	10	12	8	5	6.5	6	7	34.4	30.3	34.4	5	6	5	6.5	33.6	80	92	5	10.5	0
30 FT	11	12	8	5	6.5	5	6	32.0	31.5	35.8	5	6	5	6	33.6	80	92	5	9.5	0
32 FT	11	13	8	5	6	6	7	35.3	31.9	36.0	5	6	5	6	33.6	81	93	5	9.5	0
34 FT	11	13	8	6	7.5	6	6.5	35.3	31.9	36.0	5	6	5	6	33.6	81	93	5	9.5	0
36 FT	12	13	8	6	8	6	7	35.3	32.3	36.4	6	8	6	7	36.8	81	93	5	9.5	0
38 FT	12	14	8	6	8	6	6.5	35.3	32.5	36.8	6	8	5	6	34.4	82	94	5	9.5	0
40 FT	13	14	9	6	8	5	6	32.4	33.9	38.1	6	8	5	6.5	34.0	82	94	5	8.5	0
42 FT	13	15	10	6	8	5	7	32.8	33.3	37.5	6	7.5	5	7.5	34.5	83	95	5	9	0
44 FT	14	15	10	6	8	5	7.5	32.8	34.5	38.9	6	7.5	5	7.5	34.5	83	95	5	8.5	0
46 FT	14	16	11	6	7.5	5	7	33.3	34.9	39.3	6	7	5	7	34.9	84	96	5	9	0
48 FT	14	16	11	6	7.5	5	6.5	33.3	34.9	39.3	6	7	5	7	34.9	84	96	5	9	0
50 FT	15	16	11	6	7.5	5	7	38.1	35.3	39.6	6	7	5	7	34.9	84	96	5	8.5	0

				SF	PAN	(S)	= 6	FT		HE	IGHT	(H.			T OR	9 FT				
	М	EMBE	R			T(OP SL	AB BARS					BOT:	TOM SI				₩AI		
DESIGN	TH:	CKNE	ESS	A1	BARS			J3 BA	RS		Α2	BARS			J4 BAI	RS		В:	2 BARS	S
FILL	TS	BS	ТХ	SIZE	SPA.	SIZE	SPA.	C1	HT=8'	2 HT=9'	SIZE	SPA.	SIZE	SPA.	C4	HT=8'	3 HT=9'	SIZE	SPA.	G1
1 FT	10	10	8	5	8	4	7	51.3	26.6	29.5	5	7	4	6.5	51.3	102	114	5	12	12
2 FT	11	10	8	5	7.5	4	7	51.3	28.0	31.0	5	7	4	6	51.3	102	114	5	12	12
4 FT	8	9	9	4	6	4	6.5	51.9	24.9	27.6	5	8	4	6.5	51.9	101	113	5	12	0
6 FT	8	9	9	4	6.5	4	6.5	51.9	24.9	27.6	5	8.5	4	6	51.9	101	113	5	12	0
8 FT	8	10	9	4	6.5	4	6	51.9	25.1	27.9	4	6	4	6	51.9	102	114	5	11.5	0
10 FT	8	10	9	4	7.5	4	6.5	45.4	25.1	27.9	4	6.5	4	6.5	51.9	102	114	5	12	0
12 FT	8	10	9	4	6	5	6.5	43.8	25.1	27.9	5	8.5	4	6	51.9	102	114	5	11.5	0
14 FT	8	10	9	4	6	5	6	42.1	26.1	29.0	5	7.5	5	6.5	54.3	102	114	5	10	0
16 FT	8	10	9	4	6	6	7	44.5	28.4	31.5	5	7	5	6	54.3	102	114	5	9.5	0
18 FT	8	10	9	5	9	6	7	43.8	29.4	32.6	5	7	6	7	55.9	102	114	5	8.5	0
20 FT	9	10	9	5	8.5	5	6	43.8	29.8	33.0	5	7	6	6.5	56.8	102	114	5	8.5	0
22 FT	9	11	9	5	8	5	6	42.9	30.0	33.3	5	6.5	6	6.5	55.9	103	115	5	8.5	0
24 FT	10	11	9	5	7.5	5	6	45.4	30.3	33.5	5	6.5	6	6	55.9	103	115	5	8.5	0
26 FT	10	11	9	5	7	5	6	44.5	30.3	33.5	5	6	6	6	55.9	103	115	5	8.5	0
28 FT	10	12	9	5	6.5	6	7	47.0	31.6	35.0	5	6	6	6	55.9	104	116	5	8	0
30 FT	11	12	9	5	6.5	6	6.5	49.4	35.4	39.0	5	6	6	6	55.9	104	116	5	8	0
32 FT	11	13	10	5	6.5	6	8	46.8	32.3	35.5	5	6	6	6.5	56.6	105	117	5	8	0
34 FT	12	13	11	5	6.5	5	6.5	44.0	32.5	35.9	5	6	5	6	49.8	105	117	5	7.5	0
36 FT	12	13	11	5	6	5	6.5	44.0	32.5	35.9	6	8	6	7.5	52.3	105	117	5	7.5	0
38 FT	12	14	12	5	6	5	6	42.0	32.8	36.1	6	8	5	6	48.8	106	118	5	7	0
40 FT	13	14	12	5	6	5	6	44.5	33.0	36.4	6	8	5	6	48.8	106	118	5	7	0
42 FT	13	15	12	5	6	5	6	43.6	33.4	36.6	6	7.5	5	6	52.1	107	119	5	7	0
44 FT	14	15	13	5	6	5	6	44.3	34.8	38.3	6	7.5	5	6	48.5	107	119	5	6.5	0
46 FT	14	15	13	6	8	5	6	44.3	34.8	38.3	6	7.5	6	8	51.0	107	119	5	6.5	0
48 FT	14	16	13	6	8	5	6	44.3	35.1	38.6	6	7	5	6	50.1	108	120	5	6.5	0
50 FT	15	16	13	6	8	5	6	51.0	35.4	38.9	6	7	6	8	53.5	108	120	5	6.5	0





GENERAL NOTES:

IF DESIGN FILLES.

IF DESIGN FILLES.

FILE THE PROBLEM FI

SPECIAL DESIGNS ARE REQUIRED WHEN THE DESIGN FILL IS LESS THAN 1 FOOT OR GREATER THAN 50 FEET.

DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.

DESIGN FILLS ARE MEASURED FROM THE TOP OF TOP SLAB TO THE TOP OF EARTH FILL OR ROADWAY.

CULVERTS MEET STRENGTH AND SERVICEABILITY REQUIREMENTS FOR THE DESIGN VEHICULAR LIVE LOAD HL-93 MINUS THE LANE LOAD.



MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)



CONCRETE SINGLE BOX CULVERT

MEMBER THICKNESS BAR SIZE, SPACING & DIMENSIONS

SPAN (S): 6 FEET HEIGHT (HT): 3 THRU 9 FEET

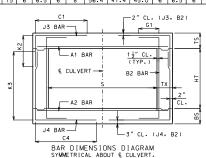
DATE EFFECTIVE: DATE PREPARED: 4/18/2011

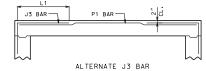
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																						_
					SPAN	(S)	= 7			HE	IGHT	(HI) =					6 FT				
		EMBE					TOP		BARS						BOTTON		BARS			WAL		
DESIGN	TH.	CKNE	ESS	A1	BARS			J3	BARS			A2	BARS			J4	BARS			B2	2 BARS	ś
FILL	TS	BS	тх	SIZE	SPA.	SIZE	SPA.	C1	HT=4'	K2 HT=5'	HT=6'	SIZE	SPA.	SIZE	SPA.	C4	HT=4'	K3 HT=5'	HT=6'	SIZE	SPA.	G1
1 FT	11	9	8	5	7.5	4	9	57.0	27.1	32.3	37.4	5	7.5	4	6	54.3	53	65	77	5	12	12
2 FT	11	9	8	5	7.5	4	9	57.0	27.1	32.3	37.4	5	7.5	5	7	43.3	53	65	77	5	12	12
4 FT	8	8	8	4	6	4	6	36.8	24.3	29.1	34.0	5	8	5	6	35.9	52	64	76	5	12	0
6 FT	8	8	8	4	6	4	6	33.1	24.3	29.1	34.0	5	8	5	6	33.1	52	64	76	5	12	0
8 FT	8	9	8	4	6	5	6.5	32.3	24.0	28.8	33.6	5	7.5	4	6.5	32.3	53	65	77	5	12	0
10 FT	8	9	8	4	6	4	6	30.4	24.0	28.8	33.6	5	7.5	4	7.5	29.5	53	65	77	5	12	0
12 FT	8	9	8	4	6	5	6	30.4	24.0	28.8	33.6	5	7.5	4	6	28.5	53	65	77	5	12	0
14 FT	8	9	8	5	8	6	7.5	33.1	28.3	33.9	39.5	5	7	5	6.5	28.5	53	65	77	5	12	0
16 FT	8	9	8	5	7	6	7	33.1	28.3	33.9	39.5	5	6.5	6	7.5	31.3	53	65	77	5	12	0
18 FT	9	10	8	5	7	5	6.5	28.5	25.4	30.4	35.3	5	6	5	7	28.5	54	66	78	5	12	0
20 FT	9	10	8	5	6	5	6	28.5	29.1	34.8	40.4	6	8	5	6	27.6	54	66	78	5	12	0
22 FT	10	11	8	5	6	5	7	28.5	26.3	31.1	36.1	6	8	5	7.5	27.6	55	67	79	5	12	0
24 FT	10	12	8	6	8	5	6	28.5	26.0	30.8	35.6	6	8	5	8.5	26.6	56	68	80	5	12	0
26 FT	11	13	8	6	8	5	7	27.6	27.5	32.4	37.3	6	8	5	8.5	26.6	57	69	81	5	12	0
28 FT	12	13	8	6	7.5	5	8	27.6	28.5	33.6	38.6	6	7.5	5	8.5	27.6	57	69	81	5	12	0
30 FT	12	14	8	6	7.5	5	7	27.6	28.3	33.3	38.1	6	7.5	5	8.5	26.6	58	70	82	5	12	0
32 FT	13	14	8	6	7	5	8	26.6	29.4	34.5	39.5	6	7	5	8.5	27.6	58	70	82	5	12	0
34 FT	13	15	8	6	7	5	7	27.6	29.1	34.0	39.0	6	7	5	8.5	26.6	59	71	83	5	12	0
36 FT	14	15	8	6	6.5	5	7.5	26.6	30.3	35.3	40.4	6	7	5	8.5	27.6	59	71	83	5	12	0
38 FT	14	16	8	6	6.5	5	7	26.6	30.6	35.8	40.8	6	7	5	8	26.6	60	72	84	5	11.5	0
40 FT	15	16	8	6	6.5	5	7.5	32.3	31.1	36.1	41.1	6	6.5	5	8	27.6	60	72	84	5	10.5	0
42 FT	15	17	8	6	6	5	7	32.3	35.3	40.9	46.5	6	6.5	5	7	27.6	61	73	85	5	10	0
44 FT	16	17	8	6	6	5	7	32.3	36.5	42.3	48.0	6	6.5	5	7	27.6	61	73	85	5	9.5	0
46 FT	16	18	8	6	6	5	6	32.3	36.3	41.9	47.5	6	6.5	5	6.5	27.6	62	74	86	5	9.5	0
48 FT	17	18	9	6	6	5	7.5	32.5	33.5	38.8	43.9	6	6.5	5	8	27.9	62	74	86	5	10	0
50 FT	17	19	9	6	6	5	7	32.5	37.1	42.8	48.4	6	6	5	7.5	27.9	63	75	87	5	9	0

				SF	PAN	(S)	= 7	FT		HE	IGH	[(H	Γ) =	7 F	T OR	8 FT				〒
		EMBE				T	DP SL	AB BARS	S				BOT	TOM SI	AB BAI	RS		WAI	L BAI	₹S
DESIGN	TH	ICKN	ESS	A1	BARS			J3 BA	RS		A2	BARS			J4 BAI	RS		B	2 BAR	5
FILL	TS	вѕ	тх	SIZE	SPA.	SIZE	SPA.	C1	HT=7'	2 HT=8'	SIZE	SPA.	SIZE	SPA.	C4	HT=7'	3 HT=8'	SIZE	SPA.	G1
1 FT	11	9	8	5	7.5	4	8	57.0	27.8	31.1	5	7.5	5	6.5	58.9	89	101	5	12	12
2 FT	11	9	8	5	7.5	4	7.5	57.0	27.8	31.1	5	7.5	5	6	58.9	89	101	5	12	12
4 FT	8	9	8	4	6	5	6.5	58.9	24.0	27.0	5	7.5	4	6	57.0	89	101	5	12	0
6 FT	8	9	8	4	6	5	6.5	46.0	25.0	28.1	5	7.5	5	6.5	50.6	89	101	5	12	0
8 FT	8	9	8	4	6	5	6	41.4	25.0	28.1	5	7.5	5	6.5	44.1	89	101	5	12	0
10 FT	8	9	8	4	6	5	6.5	35.9	25.0	28.1	5	7.5	5	6.5	36.8	89	101	5	12	0
12 FT	8	9	8	4	6	6	7.5	38.6	28.8	32.4	5	7.5	5	6	36.8	89	101	5	12	0
14 FT	8	9	8	5	8	6	7.5	37.8	28.8	32.4	5	7	6	6.5	38.6	89	101	5	12	0
16 FT	8	9	8	5	7	6	7	37.8	32.6	36.8	5	6	6	6	38.6	89	101	5	12	0
18 FT	9	10	8	5	6.5	6	7	37.8	29.4	33.0	5	6	6	6.5	38.6	90	102	5	12	0
20 FT	9	10	8	5	6	6	7	36.8	33.4	37.4	6	7.5	6	6	38.6	90	102	5	11	0
22 FT	10	11	9	5	6	5	6	34.4	30.0	33.6	6	8	5	6	35.4	91	103	5	12	0
24 FT	10	12	9	6	8.5	5	6	34.4	30.3	33.9	6	8	5	6.5	36.3	92	104	5	11	0
26 FT	11	13	9	6	8	6	7.5	38.1	31.9	35.6	6	8	5	6.5	36.3	93	105	5	10	0
28 FT	11	13	9	6	7	6	7	37.3	31.9	35.6	6	7.5	5	6	36.3	93	105	5	9.5	0
30 FT	12	13	9	6	7.5	6	7.5	37.3	33.3	37.1	6	7	6	7.5	39.0	93	105	5	8.5	0
32 FT	12	14	9	6	6.5	6	6.5	37.3	32.5	36.3	6	7	5	6	36.3	94	106	5	8.5	0
34 FT	13	14	9	6	7	6	7	38.1	33.9	37.8	6	7	6	7	39.0	94	106	5	8.5	0
36 FT	14	15	10	6	7	5	6.5	34.8	34.5	38.4	6	7	5	7	36.6	95	107	5	8	0
38 FT	14	16	11	6	7	5	6.5	36.1	34.9	38.8	6	7	5	7	37.0	96	108	5	8.5	0
40 FT	15	16	11	6	7	5	6.5	40.9	35.3	39.0	6	7	5	7	37.0	96	108	5	8	0
42 FT	15	17	11	6	6.5	5	6	40.9	35.5	39.4	6	7	5	7	37.0	97	109	5	7.5	0
44 FT	16	17	12	6	6.5	5	6.5	41.3	37.0	40.9	6	6.5	5	6.5	37.5	97	109	5	8	0
46 FT	16	18	12	6	6.5	5	6.5	41.3	36.1	40.0	6	6.5	5	6.5	37.5	98	110	5	8	0
48 FT	17	18	12	6	6.5	5	6.5	41.3	37.6	41.6	6	6.5	5	6.5	38.4	98	110	5	7.5	0
50 FT	17	18	12	6	6	5	6	41.3	37.6	41.6	6	6	5	6.5	38.4	98	110	5	7	0

				SP	4N (S) =	= 7 F	T		HE I	GHT	(HT) =	9 FT	OR 1	0 FT				
		EMBE				T(OP SL	AB BARS	5				BOT:	TOM SI	AB BAI			₩AL		
DESIGN	TH:	CKNE	ESS	A1	BARS			J3 BA	RS		Α2	BARS			J4 BAI	RS		Ba	2 BARS	ŝ
FILL	TS	BS	ТX	SIZE	SPA.	SIZE	SPA.	C1	HT=9'		SIZE	SPA.	SIZE	SPA.	C4	HT=9'		SIZE	SPA.	G1
1 FT	11	10	8	5	7.5	4	6	57.0	27.3	29.9	5	7	5	6.5	58.9	114	126	5	12	12
2 FT	11	10	8	5	7.5	5	8.5	58.9	28.5	31.3	5	7	5	6	58.9	114	126	5	11	12
4 FT	8	9	9	4	6	5	6	59.5	28.8	31.6	5	7.5	5	6	59.5	113	125	5	10.5	0
6 FT	8	10	9	4	6	5	6	59.5	29.0	31.9	5	7	5	6.5	59.5	114	126	5	10	0
8 FT	8	10	9	4	6	6	7	62.3	29.0	31.9	5	7	5	6	59.5	114	126	5	9	0
10 FT	8	10	9	4	6	5	6	46.5	26.6	29.3	5	7.5	5	6	59.5	114	126	5	10	0
12 FT	8	11	9	4	6	6	7	47.4	25.6	28.1	5	7	5	6	59.5	115	127	5	9	0
14 FT	8	11	9	5	8.5	6	7	46.5	29.3	32.1	5	6.5	6	7	62.3	115	127	5	8.5	0
16 FT	9	11	9	5	8	5	6	46.5	29.5	32.4	5	6.5	6	6.5	62.3	115	127	5	8.5	0
18 FT	9	11	9	5	7	6	7	48.4	30.8	33.8	5	6.5	6	6	64.1	115	127	5	8.5	0
20 FT	10	11	9	5	7	6	7.5	50.3	31.0	34.0	5	6	6	6	60.5	115	127	5	8.5	0
22 FT	10	12	9	5	6.5	6	6.5	49.3	31.3	34.3	5	6	6	6	62.3	116	128	5	8	0
24 FT	11	12	9	5	6	6	7	51.1	35.3	38.6	6	8.5	6	6	64.1	116	128	5	7.5	0
26 FT	11	13	10	5	6	6	7.5	48.9	33.0	36.1	5	6	6	6.5	60.1	117	129	5	8	0
28 FT	12	13	11	5	6	5	6.5	45.6	32.0	35.0	6	8	6	7	54.1	117	129	5	7.5	0
30 FT	12	14	11	6	8	5	6	45.6	32.3	35.3	6	8	6	7	56.0	118	130	5	7.5	0
32 FT	13	14	12	6	8	5	6	46.1	33.8	36.9	6	7.5	6	8	52.8	118	130	5	7	0
34 FT	13	15	12	6	8	5	6	45.1	34.0	37.1	6	7.5	6	8	55.6	119	131	5	7	0
36 FT	14	15	12	6	7.5	6	8	49.9	35.6	38.9	6	7.5	6	7.5	54.8	119	131	5	7	0
38 FT	14	16	13	6	7.5	5	6	45.6	34.6	37.8	6	7	6	8	54.4	120	132	5	6.5	0
40 FT	15	16	13	6	7.5	6	8	55.3	36.1	39.4	6	7	6	7.5	54.4	120	132	5	6.5	0
42 FT	15	17	13	6	7	6	7.5	55.3	36.5	39.8	6	7	6	7.5	56.3	121	133	5	6.5	0
44 FT	16	17	14	6	7	6	8	55.9	38.1	41.5	6	7	6	7.5	53.9	121	133	5	6	0
46 FT	16	17	14	6	7	6	7.5	55.9	38.1	41.5	6	6.5	6	7	53.9	121	133	5	6	0
48 FT	16	18	14	6	6.5	6	7	55.9	37.0	40.3	6	6.5	6	7.5	55.9	122	134	5	6	0
50 FT	17	18	15	6	6.5	6	8	56.4	41.4	45.0	6	6.5	6	7.5	53.5	122	134	6	8	0





GENERAL NOTES:

IF DESIGN FILLES.

IF DESIGN FILLES.

FILE THE PROBLEM FI

SPECIAL DESIGNS ARE REQUIRED WHEN THE DESIGN FILL IS LESS THAN 1 FOOT OR GREATER THAN 50 FEET.

DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.

DESIGN FILLS ARE MEASURED FROM THE TOP OF TOP SLAB TO THE TOP OF EARTH FILL OR ROADWAY.

CULVERTS MEET STRENGTH AND SERVICEABILITY REQUIREMENTS FOR THE DESIGN VEHICULAR LIVE LOAD HL-93 MINUS THE LANE LOAD.



MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)



CONCRETE SINGLE BOX CULVERT

MEMBER THICKNESS BAR SIZE, SPACING & DIMENSIONS

SPAN (S): 7 FEET HEIGHT (HT): 4 THRU 10 FEET

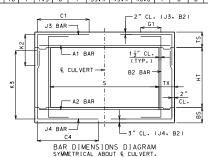
DATE EFFECTIVE: DATE PREPARED: 4/18/2011

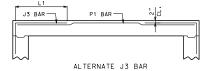
703.17

				S	PAN	(S)	= 8	FT		HE	IGHT	(HT) =	4 F	T OR	5 FT	OR	6 FT				\neg
		EMBE					TOP	SLAB E	BARS						вотток	/ SLAB	BARS			₩AI		
DESIGN	THI	CKNE	SS	A1	BARS			J3	BARS			A2	BARS			J4	BARS			В:	2 BARS	S
FILL	TS	BS	TX	SIZE	SPA.	SIZE	SPA.	C1	HT=4'	K2 HT=5'	HT=6'	SIZE	SPA.	SIZE	SPA.	C4	HT=4'	K3 HT=5'	HT=6'	SIZE	SPA.	G1
1 FT	12	9	8	5	7	4	8.5	63.5	28.1	33.5	38.8	5	7.5	5	6	44.8	53	65	77	5	12	12
2 FT	12	9	8	5	7	4	8	63.5	28.1	33.5	38.8	5	7	6	7.5	43.6	53	65	77	5	12	12
4 FT	8	8	8	5	8	6	7.5	38.5	32.5	39.0	45.6	5	6.5	6	6	38.5	52	64	76	5	12	0
6 FT	8	8	8	5	8.5	6	7.5	37.5	32.5	39.0	45.6	5	7	6	6	36.4	52	64	76	5	12	H
8 FT	8	8	8	5	8	6	7.5	36.4	32.5	39.0	45.6	5	6.5	6	6	35.4	52	64	76	5	12	ŏ
10 FT	8	8	8	5	8.5	6	7.5	34.4	32.5	39.0	45.6	5	7	6	6	34.4	52	64	76	5	12	ŏ
12 FT	8	9	8	5	7.5	6	7.5	34.4	32.4	38.9	45.4	5	6.5	6	7.5	32.3	53	65	77	5	12	0
14 FT	8	9	8	5	6.5	6	6.5	34.4	32.4	38.9	45.4	6	8	6	7	32.3	53	65	77	5	12	0
16 FT	9	10	8	5	6	5	6	30.1	29.1	34.8	40.4	6	8	5	6.5	28.1	54	66	78	5	12	0
18 FT	9	11	8	6	7.5	6	7	33.3	29.6	35.3	40.9	6	7.5	5	7.5	27.0	55	67	79	5	12	0
20 FT	10	12	8	6	7.5	5	6	29.1	26.0	30.8	35.6	6	7.5	5	8.5	26.0	56	68	80	5	12	0
22 FT	11	13	8	6	7	5	6.5	28.1	27.5	32.4	37.3	6	7	5	8.5	26.0	57	69	81	5	12	0
24 FT	12	13	8	6	7	5	7.5	27.0	32.6	38.4	44.1	6	7	5	8	26.0	57	69	81	5	12	0
26 FT	13	14	8	6	7	5	8	27.0	29.4	34.5	39.5	6	7	5	8.5	26.0	58	70	82	5	12	0
28 FT	13	15	8	6	6.5	5	7	27.0	29.1	34.0	39.0	6	6.5	5	8.5	26.0	59	71	83	5	12	0
30 FT	14	15	8	6	6	5	7.5	26.0	30.3	35.3	40.4	6	6.5	5	8.5	26.0	59	71	83	5	12	0
32 FT	15	16	8	6	6	5	7.5	31.3	35.5	41.3	47.0	6	6.5	5	8	26.0	60	72	84	5	12	0
34 FT	15	17	8	6	6	5	7	31.3	31.5	36.5	41.6	6	6.5	5	7	26.0	61	73	85	5	12	0
36 FT	16	17	8	6	6	5	7	31.3	32.6	37.9	43.0	6	6	5	7	26.0	61	73	85	5	12	0
38 FT	16	18	8	7	7.5	5	7	31.3	36.3	41.9	47.5	6	6	5	6.5	26.0	62	74	86	5	11.5	0
40 FT	17	18	8	7	7.5	5	6.5	31.3	37.5	43.3	49.0	6	6	5	6.5	26.0	62	74	86	5	10.5	0
42 FT	17	19	8	7	7	5	6.5	31.3	37.1	42.8	48.4	6	6	5	6.5	26.0	63	75	87	5	10	0
44 FT	18	19	8	7	7	5	6.5	30.1	38.4	44.1	49.9	7	7.5	5	6.5	26.0	63	75	87	5	9.5	0
46 FT	18	20	8	7	7	5	6	31.3	38.1	43.8	49.4	7	7.5	5	6	26.0	64	76	88	5	9.5	0
48 FT	19	20	8	7	7	5	6	31.3	39.4	45.1	50.9	7	7.5	5	6	26.0	64	76	88	5	9.5	0
50 FT	19	20	8	1 7	6.5	5	6	31.3	39.4	45.1	50.9	7	7	6	7.5	29.1	64	76	88	5	9.5	0

				S	PAN	(S)	= 8	FT		HE	IGHT	(H)) =	7 F	T OR	8 FT	OR	9 FT				〒
		EMBE					TOP	SLAB I	BARS						вотто	/ SLAB	BARS			₩AI	L BAF	₹S
DESIGN	TH	CKN	ESS	A1	BARS			J3	BARS			A2	BARS			J4	BARS			B	2 BARS	5
FILL	TS	BS	тх	SIZE	SPA.	SIZE	SPA.	C1		K2		SIZE	SPA.	SIZE	SPA.	C4		К3		SIZE	SPA.	G1
	13	БЭ	١٨.	SIZE	SFA.	SIZE	SFA.	CI	HT=7'	HT=8'	HT=9'	SIZE	SFA.	SIZE	SFA.	L4	HT=7'	HT=8'	HT=9'	SIZE	SFA.	101
1 FT	12	10	8	5	7	4	6.5	63.5	28.3	31.6	35.0	5	7	5	6.5	65.5	90	102	114	5	12	12
2 FT	12	10	8	5	7	4	6	63.5	28.3	31.6	35.0	5	7	5	6.5	65.5	90	102	114	5	12	12
4 FT	8	9	8	5	7.5	6	7.5	66.5	28.8	32.4	36.0	5	6.5	6	6.5	66.5	89	101	113	5	12	0
6 FT	8	9	8	5	8	6	7.5	53.0	28.8	32.4	36.0	5	7	6	6.5	58.3	89	101	113	5	12	0
8 FT	8	9	8	5	7.5	6	7.5	47.9	28.8	32.4	36.0	5	6.5	6	6	51.0	89	101	113	5	11.5	0
10 FT	8	9	8	5	8	6	7.5	41.6	28.8	32.4	36.0	5	7	6	6	43.6	89	101	113	5	12	0
12 FT	8	9	9	5	7.5	6	7	41.0	32.6	36.8	40.8	5	6.5	6	6.5	42.0	89	101	113	5	12	0
14 FT	8	10	9	5	6.5	6	6.5	41.0	28.1	31.6	35 - 1	5	6	6	7	42.0	90	102	114	5	12	0
16 FT	9	10	9	5	6	6	7.5	41.0	29.4	33.0	36.6	6	7.5	6	6.5	42.0	90	102	114	5	12	0
18 FT	9	11	9	6	8	6	6.5	39.9	29.8	33.3	36.9	6	7.5	6	7	42.0	91	103	115	5	11	0
20 FT	10	11	9	6	7.5	6	7	39.9	30.0	33.6	37.3	6	6.5	6	6	42.0	91	103	115	5	10	0
22 FT	11	12	9	6	7.5	6	7	39.9	31.6	35.4	39.0	6	7	6	6.5	42.0	92	104	116	5	9	0
24 FT	11	13	9	6	6.5	6	6.5	39.9	31.9	35.6	39.4	6	6.5	6	7	42.0	93	105	117	5	8.5	0
26 FT	12	14	10	6	7	5	6	38.1	32.5	36.3	40.0	6	7	5	6.5	39.3	94	106	118	5	9	0
28 FT	13	15	10	6	7	6	7.5	40.3	33.1	36.9	40.6	6	7	5	6.5	39.3	95	107	119	5	8	0
30 FT	13	15	10	6	6.5	6	6.5	40.3	33.1	36.9	40.6	6	6.5	5	6	39.3	95	107	119	5	8	0
32 FT	14	16	11	6	6.5	6	8.5	40.6	34.9	38.8	42.5	6	6.5	5	7	39.6	96	108	120	5	8	0
34 FT	15	17	11	6	6.5	6	8	47.1	35.5	39.4	43.3	6	6.5	5	7	39.6	97	109	121	5	7.5	0
36 FT	15	17	11	6	6	6	7	47.1	35.5	39.4	43.3	6	6	5	6.5	39.6	97	109	121	5	7.5	0
38 FT	16	18	12	6	6	6	8	47.5	36.1	40.0	43.9	6	6	5	6.5	40.0	98	110	122	5	7.5	0
40 FT	17	18	12	6	6	6	8	47.5	37.6	41.6	45.5	6	6	5	6.5	40.0	98	110	122	5	7	0
42 FT	17	19	12	7	8	6	7.5	47.5	38.0	41.9	45.9	6	6	5	6.5	41.0	99	111	123	5	7	0
44 FT	18	19	13	7	8	5	6	44.8	38.3	42.3	46.3	6	6	5	6	40.4	99	111	123	5	7	0
46 FT	18	20	13	7	7.5	6	8	48.0	38.6	42.6	46.5	7	8	5	6	41.4	100	112	124	5	6.5	0
48 FT	19	20	13	7	7.5	6	8	48.0	40.1	44.3	48.3	7	7.5	5	6	41.4	100	112	124	5	6.5	0
50 FT	19	21	13	7	7	6	7	48.0	39.3	43.3	47.3	7	7.5	5	6	41.4	101	113	125	5	6.5	0

				SPA	AN C	S) =	- 8 F	T		HE I	GHT	(HT:) =	10 F	T OR	11 F	T			
		EMBE				T(OP SL	AB BARS	ŝ				BOT	TOM SI	AB BA	RS		₩AL		
DESIGN	TH:	CKNE	ESS	A1	BARS			J3 BA	RS		Α2	BARS			J4 BA	RS		Ba	2 BARS	ŝ
FILL	TS	BS	ТХ	SIZE	SPA.	SIZE	SPA.	C1	K HT=10'		SIZE	SPA.	SIZE	SPA.	C4	HT=10'	3 HT=11	SIZE	SPA.	G1
1 FT	11	10	8	5	6.5	5	7.5	65.5	31.3	34.0	5	6.5	6	6.5	66.5	126	138	5	9.5	12
2 FT	11	10	8	5	6.5	5	7	65.5	31.3	34.0	5	6	6	6	66.5	126	138	5	9.5	12
4 FT	8	9	9	5	7.5	6	7	68.3	33.0	36.0	5	6	6	6	68.3	125	137	5	8.5	0
6 FT	8	10	9	5	8.5	6	7	68.3	30.6	33.4	5	7	6	6.5	68.3	126	138	5	8.5	0
8 FT	8	10	9	5	8	6	7	68.3	33.3	36.3	5	7	6	6	68.3	126	138	5	8.5	0
10 FT	8	10	9	5	8.5	6	7	52.5	30.6	33.4	5	7	6	6	68.3	126	138	5	8.5	0
12 FT	8	10	9	5	7.5	6	6.5	50.4	33.3	36.3	5	6.5	6	6	65.1	126	138	5	8.5	0
14 FT	9	11	9	5	7	6	7	52.5	31.0	33.8	5	6.5	6	6	69.3	127	139	5	8.5	0
16 FT	9	11	9	5	6	6	6	50.4	33.8	36.8	6	8	6	6	64.0	127	139	5	8.5	0
18 FT	10	12	9	5	6	6	6	52.5	34.3	37.3	6	8	6	6	68.3	128	140	5	8	0
20 FT	11	12	10	5	6	5	6	48.8	31.8	34.5	6	7.5	6	6.5	58.3	128	140	5	8	0
22 FT	11	13	10	6	8	6	7	50.9	33.4	36.3	6	7.5	6	6.5	60.4	129	141	5	7.5	0
24 FT	12	13	11	6	7.5	6	8	51.4	33.6	36.5	6	7	6	7	56.8	129	141	5	7.5	0
26 FT	12	14	11	6	7	6	7.5	50.3	33.9	36.8	6	7	6	7	57.8	130	142	5	7.5	0
28 FT	13	15	12	6	7.5	6	8	50.8	34.4	37.3	6	7	6	7.5	57.3	131	143	5	7	0
30 FT	14	15	12	6	7	6	7.5	51.9	36.0	39.0	6	6.5	6	7	57.3	131	143	5	7	0
32 FT	14	16	13	6	7	6	8	51.3	36.3	39.3	6	6.5	6	7.5	56.6	132	144	5	6.5	0
34 FT	15	16	13	6	6.5	6	7.5	57.8	36.5	39.5	6	6.5	6	7	55.6	132	144	5	6.5	0
36 FT	15	17	13	6	6.5	6	6.5	57.8	36.8	39.8	6	6.5	6	7	57.8	133	145	5	6.5	0
38 FT	16	18	14	6	6.5	6	7.5	58.3	37.3	40.3	6	6.5	6	7.5	57.3	134	146	5	6	0
40 FT	16	18	14	6	6	6	7	58.3	37.3	40.3	6	6	6	7	57.3	134	146	5	6	0
42 FT	17	19	15	6	6	6	7	58.9	42.3	45.6	6	6	6	7.5	56.6	135	147	6	8	0
44 FT	17	19	15	6	6	6	6.5	57.8	42.3	45.6	6	6	6	7	56.6	135	147	6	8	0
46 FT	18	19	15	6	6	6	7	58.9	42.5	45.9	7	8	6	6	56.6	135	147	6	8	0
48 FT	18	20	16	7	8	6	7	58.3	42.9	46.3	7	8	6	7	56.0	136	148	6	8	0
50 FT	19	21	16	7	7.5	6	7	59.4	43.4	46.8	7	8	6	7	58.3	137	149	6	8	0





GENERAL NOTES:

IF DESIGN FILLES.

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FILE THE PROBLEM FI

SPECIAL DESIGNS ARE REQUIRED WHEN THE DESIGN FILL IS LESS THAN 1 FOOT OR GREATER THAN 50 FEET.

DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.

DESIGN FILLS ARE MEASURED FROM THE TOP OF TOP SLAB TO THE TOP OF EARTH FILL OR ROADWAY.

CULVERTS MEET STRENGTH AND SERVICEABILITY REQUIREMENTS FOR THE DESIGN VEHICULAR LIVE LOAD HL-93 MINUS THE LANE LOAD.



MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)

CONCRETE



SINGLE BOX CULVERT

MEMBER THICKNESS BAR SIZE. SPACING & DIMENSIONS

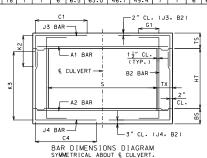
SPAN (S): 8 FEET HEIGHT (HT): 4 THRU 11 FEET

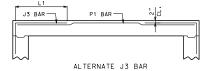
DATE EFFECTIVE: DATE PREPARED: 04/01/2011 4/18/2011 703.17

				_																		\neg
				S	PAN	(S)	= 9			HE	IGHT	(H)) =	5 F		6 FT		7 FT				
		EMBE					TOP		BARS						вотто	/ SLAB				₩AI		
DESIGN	TH:	CKNE	SS	A1	BARS			J3	BARS			A2	BARS			J4	BARS			B:	2 BARS	š
FILL	TS	BS	тх	SIZE	SPA.	SIZE	SPA.	C1		K2		SIZE	SPA.	S 1 7F	SPA.	C4		К3		SIZE	SPA.	_{G1}
						JILL	J. A.		HT=5'	HT=6'	HT=7'					• •	HT=5'	HT=6'	HT=7'			
1 FT	12	9	8	5	6.5	4	7	69.6	28.1	32.5	37.0	5	6.5	6	7.5	54.5	65	77	89	5	12	12
2 FT	12	9	8	5	6.5	4	7	69.6	28.1	32.5	37.0	5	6	6	7	48.8	65	77	89	5	12	12
4 FT	8	9	8	5	6.5	6	7	42.9	32.4	37.8	43.3	5	6	6	7.5	42.9	65	77	89	5	12	0
6 FT	8	9	8	5	7	6	7.5	40.6	32.4	37.8	43.3	5	6	6	7	39.5	65	77	89	5	12	0
8 FT	8	10	8	5	6.5	6	7	39.5	24.1	28.0	32.0	5	6	5	6.5	33.6	66	78	90	5	12	0
10 FT	8	10	8	5	7	6	7.5	37.1	24.1	28.0	32.0	5	6.5	4	6	31.4	66	78	90	5	12	0
12 FT	8	10	8	5	6	6	6	37.1	28.5	33.1	37.9	6	8	5	6.5	30.1	66	78	90	5	12	0
14 FT	9	10	8	6	7.5	6	7	34.8	29.6	34.4	39.3	6	7	5	6	30.1	66	78	90	5	12	0
16 FT	9	11	8	6	7	6	6	34.8	29.3	33.9	38.6	6	6.5	5	7	29.0	67	79	91	5	12	0
18 FT	10	12	8	6	6.5	6	6.5	33.6	30.0	34.8	39.4	6	6.5	5	7.5	29.0	68	80	92	5	12	0
20 FT	11	13	8	6	6	6	7	33.6	31.6	36.4	41.3	6	6	5	8	29.0	69	81	93	5	12	0
22 FT	12	14	8	6	6	5	6	29.0	32.4	37.3	42.0	6	6	5	8.5	27.9	70	82	94	5	12	0
24 FT	13	15	8	6	6	5	6	29.0	29.0	33.3	37.5	6	6	5	8.5	27.9	71	83	95	5	12	0
26 FT	14	16	8	6	6	5	6	29.0	30.6	34.9	39.3	6	6	5	8	27.9	72	84	96	5	12	0
28 FT	15	16	8	7	7.5	5	6.5	33.6	35.3	40.1	45.1	7	8	5	8	27.9	72	84	96	5	12	0
30 FT	15	17	8	7	7	6	8	37.1	35.6	40.6	45.5	7	7.5	5	- 7	27.9	73	85	97	5	11.5	0
32 FT	16	17	8	7	7	5	6	32.5	36.1	41.0	45.9	7	7.5	5	6.5	27.9	73	85	97	5	10	0
34 FT	17	18	8	7	7	5	6	32.5	37.8	42.9	47.9	7	7.5	5	6.5	29.0	74	86	98	5	9.5	0
36 FT	17	19	9	7	7	5	6	33.9	37.3	42.3	47.1	7	7.5	5	7.5	29.3	75	87	99	5	10.5	0
38 FT	18	20	9	7	7	5	6	33.9	38.1	43.0	48.0	7	7.5	5	7	29.3	76	88	100	5	9.5	0
40 FT	19	20	9	7	6.5	5	6.5	33.9	39.5	44.5	49.5	7	7	5	7	29.3	76	88	100	5	8.5	0
42 FT	19	21	10	7	6.5	5	6.5	34.3	39.9	45.0	50.0	7	7	5	7.5	29.5	77	89	101	5	10	0
44 FT	20	21	10	7	6.5	5	6.5	34.3	40.4	45.4	50.4	7	6.5	5	7.5	29.5	77	89	101	5	9.5	0
46 FT	21	22	10	7	6.5	5	6.5	34.3	41.1	46.3	51.3	7	7	5	7	29.5	78	90	102	5	8.5	0
48 FT	21	22	10	7	6	5	6.5	34.3	41.1	46.3	51.3	7	6.5	5	7	29.5	78	90	102	5	8	0
50 FT	22	23	10	7	6	5	6.5	34.3	42.0	47.0	52.1	7	6.5	5	6.5	30.6	79	91	103	5	8	0

				SF	AN (S)	= 9	FT		HE	IGHT	(HT:	= 8	FT	OR	9 FT	OR 1	0 FT				〒
		EMBE					TOP	SLAB E	BARS						вотток	SLAB	BARS			WAI	L BAF	₹S
DESIGN	TH	CKNE	ESS	A1	BARS			J3	BARS			A2	BARS			J4	BARS			В	2 BARS	ŝ
FILL	TS	BS	тх	SIZE	SPA.	SIZE	SPA.	C1	HT=8'	K2 HT=9'	HT=10'	SIZE	SPA.	SIZE	SPA.	C4	HT=8'	K3 HT=9'	HT=10'	SIZE	SPA.	G1
1 FT	12	11	8	5	6.5	5	8.5	70.8	29.6	32.8	35.9	5	6.5	5	6.5	70.8	103	115	127	5	12	12
2 FT	12	11	8	5	6.5	5	8.5	70.8	29.6	32.8	35.9	5	6	5	6	70.8	103	115	127	5	11.5	12
4 FT	8	10	9	5	6.5	6	7	67.9	26.1	29.0	31.9	5	6	5	6	72.5	102	114	126	5	11.5	0
6 FT	8	10	9	5	7	6	7	53.9	28.4	31.5	34.6	5	6	6	7	64.4	102	114	126	5	11	0
8 FT	8	10	9	5	6.5	6	6.5	49.1	28.4	31.5	34.6	5	6	6	6.5	55.0	102	114	126	5	10.5	0
10 FT	8	10	9	5	7	6	7	44.5	28.4	31.5	34.6	5	6.5	6	7	46.8	102	114	126	5	12	0
12 FT	9	10	9	5	6.5	5	6	41.0	29.8	33.0	36.1	6	8	6	6	45.6	102	114	126	5	11.5	0
14 FT	9	10	9	6	8	6	6.5	43.3	33.0	36.6	40.3	6	6.5	6	6	45.6	102	114	126	5	10.5	0
16 FT	10	11	9	6	7.5	6	7	43.3	30.3	33.5	36.8	6	6.5	6	6	45.6	103	115	127	5	9.5	0
18 FT	10	12	9	6	6.5	6	6	43.3	31.6	35.0	38.4	6	6.5	6	6	45.6	104	116	128	5	8.5	0
20 FT	11	13	9	6	6.5	6	6.5	43.3	31.0	34.3	37.5	6	6.5	6	6	45.6	105	117	129	5	8.5	0
22 FT	12	13	9	6	6	6	6.5	43.3	33.6	37.1	40.6	6	6	7	6.5	48.0	105	117	129	5	8.5	0
24 FT	13	14	10	6	6	6	7	43.6	33.0	36.4	39.8	6	6	6	6.5	44.9	106	118	130	5	8	0
26 FT	14	15	10	6	6	6	7	43.6	34.8	38.3	41.8	6	6	6	7	44.9	107	119	131	5	8	0
28 FT	14	16	11	7	8	6	7	44.0	35.1	38.6	42.0	7	8	5	6	42.9	108	120	132	5	7.5	0
30 FT	15	17	11	7	8	6	6.5	50.0	35.6	39.1	42.6	6	6	5	6	42.9	109	121	133	5	7.5	0
32 FT	16	18	12	6	6	6	7.5	50.4	36.3	39.8	43.3	6	6	5	6	43.3	110	122	134	5	7	0
34 FT	16	18	12	7	7.5	6	7	50.4	36.3	39.8	43.3	7	7.5	5	6	43.3	110	122	134	5	7	0
36 FT	17	19	13	7	7.5	6	7.5	50.9	38.1	41.8	45.3	7	7.5	5	6	43.5	111	123	135	5	7	0
38 FT	18	20	13	7	7.5	6	7.5	50.9	38.8	42.3	45.9	7	7.5	5	6	43.5	112	124	136	5	6.5	0
40 FT	18	20	13	7	7	6	7	50.9	38.8	42.3	45.9	7	7	6	8.5	46.0	112	124	136	5	6.5	0
42 FT	19	21	13	7	7	6	6.5	50.9	39.3	42.9	46.5	7	7	6	8	47.3	113	125	137	5	6.5	0
44 FT	19	21	14	7	6.5	6	6.5	51.3	39.3	42.9	46.5	7	7	5	6	43.9	113	125	137	5	6	0
46 FT	20	22	14	7	6.5	6	7	51.3	41.3	45.0	48.6	7	7	6	8.5	47.6	114	126	138	5	6	0
48 FT	20	22	14	7	6.5	6	6	51.3	45.3	49.3	53.4	7	6.5	6	7.5	47.6	114	126	138	5	6	0
50 FT	21	23	14	7	6.5	6	6	51.3	41.9	45.6	49.3	7	6.5	6	8	47.6	115	127	139	5	6	0

				SPA	AN (S	S) =	= 9 F	T		HE I	GHT	(HT		11 F	T OR	12 F	T			
	М	EMBE	R			T(OP SL	AB BARS					BOT:	TOM SI	AB BA			₩AL		
DESIGN	TH:	CKNE	SS	A1	BARS			J3 BA	RS		Α2	BARS			J4 BA	RS		Ba	2 BARS	S
FILL	TS	BS	ТX	SIZE	SPA.	SIZE	SPA.	C1	HT=11'	2 HT=12'	SIZE	SPA.	SIZE	SPA.	C4	HT=11	.3 HT=12	SIZE	SPA.	G1
1 FT	11	11	8	5	6	5	6	70.8	31.3	33.8	5	6	6	6	73.1	139	151	5	9.5	12
2 FT	11	12	8	6	8.5	6	7	73.1	33.0	35.6	5	6	6	6	73.1	140	152	5	9.5	12
4 FT	8	10	9	5	6	6	6.5	73.8	33.4	36.1	6	8	6	6	73.8	138	150	5	8.5	0
6 FT	8	11	9	5	7	6	6.5	73.8	32.1	34.8	5	6	6	6	73.8	139	151	5	8.5	0
8 FT	9	11	9	5	7	6	7	73.8	30.9	33.4	5	6	6	6	73.8	139	151	5	8.5	0
10 FT	9	11	9	5	7.5	6	7	58.5	30.9	33.4	5	6.5	6	6	73.8	139	151	5	8.5	0
12 FT	9	12	9	5	6.5	6	6	56.1	34.0	36.8	5	6	6	6	73.8	140	152	5	8.5	0
14 FT	10	12	9	5	- 6	6	6	57.4	34.3	37.0	6	8	6	6	73.8	140	152	5	7.5	0
16 FT	10	12	10	6	8	6	6.5	53.1	34.3	37.0	6	7	6	6	63.8	140	152	5	8	0
18 FT	11	13	10	6	7.5	6	6.5	54.3	36.3	39.1	6	7	6	6	64.9	141	153	5	7.5	0
20 FT	11	13	11	6	6.5	6	6.5	52.4	36.3	39.1	6	6.5	6	7	59.5	141	153	5	7.5	0
22 FT	12	14	12	6	7	6	8	52.8	33.6	36.3	6	6.5	6	7.5	58.8	142	154	5	7	0
24 FT	13	15	12	6	6.5	6	7.5	54.0	37.3	40.1	6	6.5	6	7	60.0	143	155	5	7	0
26 FT	14	15	13	6	6.5	6	7.5	54.5	35.9	38.6	6	6	6	6.5	56.9	143	155	5	6.5	0
28 FT	14	16	13	6	6	6	7	53.3	39.3	42.3	6	6	6	7	58.1	144	156	5	6.5	0
30 FT	15	17	13	6	6	6	6.5	60.5	39.8	42.8	6	6	6	6.5	60.5	145	157	5	6.5	0
32 FT	16	17	14	6	6	6	7	61.0	40.0	43.0	6	6	6	6	57.4	145	157	5	6	0
34 FT	16	18	14	7	8	6	6.5	61.0	40.3	43.3	7	7.5	6	6.5	58.5	146	158	5	6	0
36 FT	17	19	15	6	6	6	7	60.3	42.4	45.5	7	8	6	6.5	59.0	147	159	6	8	0
38 FT	18	19	15	7	7.5	6	6.5	61.5	42.6	45.8	7	7.5	6	6.5	57.8	147	159	6	8	0
40 FT	18	20	15	7	7.5	6	6	61.5	42.9	46.0	7	7.5	6	6.5	60.3	148	160	6	8	0
42 FT	19	21	16	7	7.5	6	6.5	62.0	43.4	46.5	7	7.5	6	6.5	59.5	149	161	6	8	0
44 FT	19	21	16	7	7	6	6	62.0	43.4	46.5	7	7	6	6.5	59.5	149	161	6	8	0
46 FT	20	22	17	7	7	6	6.5	62.5	45.6	48.9	7	7	6	6.5	58.8	150	162	6	7.5	0
48 FT	20	22	17	7	7	6	6	61.3	45.6	48.9	7	7	6	6.5	58.8	150	162	6	7.5	0
50 FT	21	23	18	7	7	6	6.5	63.0	46.1	49.4	7	7	6	6.5	59.3	151	163	6	7	0





GENERAL NOTES:

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IF DESIGN FILLES.

FILE THE PROBLEM FI

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DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.

DESIGN FILLS ARE MEASURED FROM THE TOP OF TOP SLAB TO THE TOP OF EARTH FILL OR ROADWAY.

CULVERTS MEET STRENGTH AND SERVICEABILITY REQUIREMENTS FOR THE DESIGN VEHICULAR LIVE LOAD HL-93 MINUS THE LANE LOAD.



MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)



CONCRETE SINGLE BOX CULVERT

MEMBER THICKNESS BAR SIZE, SPACING & DIMENSIONS

SPAN (S): 9 FEET HEIGHT (HT): 5 THRU 12 FEET

DATE EFFECTIVE: DATE PREPARED: 04/01/2011 4/18/2011 703.17

7 OF 14

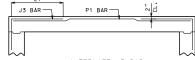
SHEET NO.

				SF	AN (S)	= 10	FT		H(IGHT	(HT) =	5 F	T OR	6 FT	OR	7 FT				
		EMBE					TOP	SLAB E	BARS					E	BOTTON	/ SLAB	BARS			WAL	LL BAF	RS
DESIGN	TH:	CKNE	ESS	A1	BARS			J3	BARS			A2	BARS			J4	BARS			Ba	2 BARS	5
FILL	TS	BS	тх	S 1 7 F	SPA.	S 1 7 F	SPA.	C1		K2		SIZE	SPA.	SIZE	SPA.	C4		К3		SIZE	SPA.	G1
 									HT=5'	HT=6'	HT=7'						HT=5'				-	
1 FT	12	9	8	5	6	4	6	75.5	28.1	32.5	37.0	5	6	6	6.5	52.5	65	77	89	5	12	12
2 FT	12	10	8	5	6	5	7.5	76.8	32.4	37.4	42.4	5	6	5	6.5	44.8	66	78	90	5	12	12
4 FT	8	9	8	6	8	7	6.5	44.8	32.4	37.8	43.3	6	7.5	6	7	42.3	65	77	89	5	12	0
6 FT	8	10	8	6	8.5	6	6	42.3	28.5	33.1	37.9	6	7.5	5	6.5	35.9	66	78	90	5	12	0
8 FT	8	10	8	6	7.5	7	6	43.5	28.5	33.1	37.9	6	7	5	6.5	33.3	66	78	90	5	12	0
10 FT	9	10	8	6	7	6	6.5	38.4	29.6	34.4	39.3	6	6.5	6	7	35.9	66	78	90	5	12	0
12 FT	9	10	8	6	7.5	6	6.5	35.9	29.6	34.4	39.3	6	6.5	6	7	34.5	66	78	90	5	12	0
14 FT	9	11	8	6	6.5	7	6	39.6	29.3	33.9	38.6	6	6	5	7	29.5	67	79	91	5	12	0
16 FT	10	12	8	6	6	6	6	34.5	30.0	34.8	39.4	6	6	5	7.5	28.1	68	80	92	5	12	0
18 FT	11	13	8	7	7.5	6	6.5	33.3	31.6	36.4	41.3	7	7.5	5	8	28.1	69	81	93	5	12	0
20 FT	12	14	8	7	7.5	6	7	33.3	32.4	37.3	42.0	7	7.5	5	8.5	26.9	70	82	94	5	12	0
22 FT	13	15	8	7	7	6	7.5	32.0	33.3	38.0	42.8	7	7.5	5	8.5	26.9	71	83	95	5	12	0
24 FT	14	16	8	7	7	6	8	30.8	34.0	38.8	43.6	7	7.5	5	8	26.9	72	84	96	5	12	0
26 FT	15	17	8	7	6.5	6	8	37.1	35.6	40.6	45.5	7	7	5	7	26.9	73	85	97	5	12	0
28 FT	16	18	8	7	6.5	6	8.5	35.9	36.5	41.4	46.4	7	7	5	6.5	26.9	74	86	98	5	12	0
30 FT	17	18	8	7	6.5	5	6	32.0	37.8	42.9	47.9	7	6.5	5	6.5	26.9	74	86	98	5	11.5	0
32 FT	18	19	8	7	6.5	5	6	32.0	38.6	43.6	48.8	7	6.5	5	6.5	26.9	75	87	99	5	10	0
34 FT	18	20	8	7	6	6	7.5	35.9	38.1	43.0	48.0	7	6.5	5	6	26.9	76	88	100	5	9.5	0
36 FT	19	21	8	7	6	6	7.5	35.9	39.9	45.0	50.0	7	6.5	6	7.5	30.8	77	89	101	5	9.5	0
38 FT	20	21	8	7	6	6	7.5	35.9	44.1	49.6	55.3	7	6.5	6	7.5	30.8	77	89	101	5	9.5	0
40 FT	21	22	8	7	6	6	7	35.9	45.1	50.6	56.1	7	6.5	6	7	30.8	78	90	102	5	9	0
42 FT	21	23	9	8	7.5	5	6	33.5	41.6	46.6	51.6	7	6	5	6	28.4	79	91	103	5	8.5	0
44 FT	22	23	9	8	7.5	6	7.5	37.4	42.0	47.0	52.1	7	6	5	6	28.4	79	91	103	5	8.5	0
46 FT	23	24	10	8	7.5	5	6.5	33.8	43.9	49.0	54.1	7	6	5	6.5	28.6	80	92	104	5	8.5	0
48 FT	23	25	10	8	7	5	6	33.8	43.3	48.3	53.4	7	6	5	6	28.6	81	93	105	5	8	0
50 FT	24	25	10	8	7	5	6	33.8	44.8	49.9	55.0	7	6	5	6	28.6	81	93	105	5	8	0

48 F I	23	25	10	8	-	5	ь	33.8	43.3	48.3	53.4	- (ь	5	٥	28.6	81	93	105	5	υ	0
50 FT	24	25	10	8	7	5	6	33.8	44.8	49.9	55.0	7	6	5	6	28.6	81	93	105	5	8	0
				SPA	N (S	()	10	FT		HE:	GHT	(HT)	= 1	11 F	T OR	12 F	T OR	13 F	T			
	М	EMBE	R				TOP	SLAB E	BARS					E	BOTTON	/ SLAB	BARS			WAL	L BAF	₹S
DESIGN	THI	CKNE	SS	A1	BARS			J3	BARS			A2	BARS			J4	BARS			Ba	BARS	5
FILL	TC	0.0	T.V.	C 1.75	SPA.	C 1.7F	SPA.			K2		SIZE	SPA.	C 1.75	CDA	0.4		К3		SIZE	SPA.	G1
	TS	BS	TX	SIZE	SPA.	SIZE	SPA.	C1	HT=11'	HT=12'	HT=13'	SIZE	SPA.	SIZE	SPA.	C4	HT=111	HT=12	HT=13	SIZE	SPA.	اناا
1 FT	11	11	9	6	8	6	7.5	80.0	31.3	33.8	36.4	6	7.5	6	6	80.0	139	151	163	5	8.5	12
2 FT	11	11	9	6	7.5	6	7	80.0	35.8	38.6	41.5	6	7.5	6	6	80.0	139	151	163	5	8.5	12
4 FT	9	11	9	6	8	6	6.5	80.0	33.8	36.6	39.4	6	7.5	6	6	80.0	139	151	163	5	8	0
6 FT	9	12	9	5	6	6	6	80.0	31.1	33.6	36.1	6	7.5	6	6	80.0	140	152	164	5	7.5	0
8 FT	9	12	10	5	6	6	6.5	75.4	31.1	33.6	36.1	6	7.5	6	6.5	80.6	140	152	164	5	7.5	0
10 FT	10	12	10	6	8	6	6.5	74.1	32.8	35.4	38.0	6	7	6	6	80.6	140	152	164	5	7	0
12 FT	10	12	10	6	8.5	6	6.5	58.5	32.8	35.4	38.0	6	7.5	6	6	71.5	140	152	164	5	8	0
14 FT	10	13	10	6	7.5	6	6	57.3	31.5	34.0	36.5	6	7	6	6	74.1	141	153	165	5	7	0
16 FT	11	13	11	6	7	6	6.5	56.4	33.3	35.9	38.5	6	6.5	6	6.5	65.5	141	153	165	5	7.5	0
18 FT	12	14	12	6	7	6	7.5	56.8	33.6	36.3	39.0	6	6.5	6	7.5	63.4	142	154	166	5	7	0
20 FT	13	15	12	6	6.5	6	7	56.8	35.6	38.4	41.1	6	6	6	7	64.6	143	155	167	5	7	0
22 FT	13	15	13	6	6	6	7	55.9	35.6	38.4	41.1	7	8	6	7	61.1	143	155	167	5	6.5	0
24 FT	14	16	13	6	6	6	6.5	57.3	36.1	38.9	41.6	7	7.5	6	7	61.1	144	156	168	5	6.5	0
26 FT	15	17	13	7	8	6	6	63.9	36.6	39.4	42.1	7	7.5	6	6	62.5	145	157	169	5	6.5	0
28 FT	16	18	14	7	8	6	6.5	63.0	38.6	41.5	44.4	7	7.5	6	6.5	61.6	146	158	170	5	6	0
30 FT	16	18	14	7	7	6	6	63.0	40.3	43.3	46.3	7	7	6	6	61.6	146	158	170	5	6	0
32 FT	17	19	15	7	7	6	6	63.5	42.4	45.5	48.6	7	7	6	6	60.8	147	159	171	6	8	0
34 FT	18	20	15	7	7	6	6	63.5	42.9	46.0	49.1	7	7	6	6	62.1	148	160	172	6	8	0
36 FT	19	21	16	7	7	6	6	63.9	43.4	46.5	49.6	7	7	6	6	62.5	149	161	173	6	8	0
38 FT	19	21	16	7	6.5	7	7.5	69.4	43.4	46.5	49.6	7	6.5	6	6	61.3	149	161	173	6	8	0
40 FT	20	22	17	7	6.5	6	6	64.4	45.6	48.9	52.1	7	6.5	6	6	61.6	150	162	174	6	7.5	0
42 FT	21	23	17	7	6.5	7	7.5	69.9	46.1	49.4	52.6	7	6.5	6	6	63.0	151	163	175	6	7.5	0
44 FT	21	23	18	7	6.5	6	6	64.9	46.1	49.4	52.6	7	6.5	6	6	62.1	151	163	175	6	7	0
46 FT	22	24	19	7	6.5	6	6	65.4	46.8	50.0	53.3	7	6.5	6	6	62.5	152	164	176	6	6.5	0
48 FT	23	25	19	7	6	6	6	65.4	47.3	50.5	53.8	7	6	6	6	62.5	153	165	177	6	6.5	0
50 FT	23	25	20	7	6	6	6	65.8	47.3	50.5	53.8	7	6	6	6	63.0	153	165	177	6	6.5	0

0" 01 / 17 00 1

_	J3 BAR
2	
	A1 BAR 1½" CL.
× 3	€ CULVERT → B2 BAR → TX
¥	
•	
	J4 BAR 3" CL. (J4. B2)
	BAR DIMENSIONS DIAGRAM SYMMETRICAL ABOUT & CULVERT.



ALTERNATE J3 BAR

																						=
				SP	'AN (S)	= 10	FT		HE	IGHT	(H)) =	8 F	T OR	9 FT	OR	10 FT				
		EMBE					TOP	SLAB E	BARS						BOTTON	/ SLAB	BARS			WAL	L BAF	₹S
DESIGN	THI	CKN	ESS	A1	BARS			J3	BARS			A2	BARS			J4	BARS			Ba	BAR:	5
FILL	TS	BS	тх	C 1.75	SPA.	C 1.75	CD4	C1		K2		C 1 7 F	SPA.	C 1 7F	SPA.	C4		К3		SIZE	SPA.	G1
	15	82	' ×	SIZE	SPA.	SIZE	SPA.	CI	HT=8'	HT=9'	HT=10'	SIZE	SPA.	SIZE	SPA.	L4	HT=8'	HT=9'	HT=10	SIZE	SPA.	61
1 FT	12	11	8	5	6	5	8	76.8	33.0	36.5	40.0	5	6	5	6	76.8	103	115	127	5	12	12
2 FT	12	11	8	6	8	5	7	76.8	33.0	36.5	40.0	6	8	6	7.5	79.4	103	115	127	5	11.5	12
4 FT	8	10	9	6	8	6	6	59.4	28.4	31.5	34.6	6	7.5	6	7	68.4	102	114	126	5	12	0
6 FT	8	10	9	6	8	6	6	51.6	32.8	36.3	39.9	6	7.5	6	6.5	56.8	102	114	126	5	11.5	0
8 FT	9	10	9	6	8	6	7	49.0	33.0	36.6	40.3	6	7	6	6	51.6	102	114	126	5	11.5	0
10 FT	9	11	9	6	7.5	6	6	47.8	30.0	33.3	36.5	6	7	6	6.5	49.0	103	115	127	5	11	0
12 FT	9	11	9	6	7.5	6	6.5	43.9	30.0	33.3	36.5	6	7	6	6.5	43.9	103	115	127	5	12	0
14 FT	10	11	9	6	7	6	6.5	42.6	31.4	34.8	38.1	6	6	6	6	43.9	103	115	127	5	12	0
16 FT	10	12	9	6	6	6	6	42.6	30.5	33.8	37.0	7	8	6	6.5	42.6	104	116	128	5	10.5	0
18 FT	11	13	9	6	6	6	6	42.6	31.0	34.3	37.5	7	7.5	6	6.5	42.6	105	117	129	5	9.5	0
20 FT	12	14	9	7	7.5	6	6.5	41.3	32.8	36.1	39.5	7	7.5	6	6.5	42.6	106	118	130	5	8.5	0
22 FT	13	15	9	7	7.5	6	6	41.3	33.4	36.6	40.0	7	7.5	6	6.5	42.6	107	119	131	5	8.5	0
24 FT	14	16	10	7	7.5	6	7	41.6	35.1	38.6	42.0	7	7.5	6	8	42.9	108	120	132	5	8	0
26 FT	15	17	11	7	7.5	6	7	48.5	35.6	39.1	42.6	7	7.5	5	6	40.6	109	121	133	5	8.5	0
28 FT	16	18	11	7	7	6	7	48.5	36.3	39.8	43.3	7	7.5	5	6	40.6	110	122	134	5	7.5	0
30 FT	17	19	12	7	7	6	7.5	48.9	38.1	41.8	45.3	7	7	5	6	40.9	111	123	135	5	8	0
32 FT	17	19	12	7	6.5	6	7	48.9	38.1	41.8	45.3	7	7	5	6	40.9	111	123	135	5	7.5	0
34 FT	18	20	12	7	6.5	6	7	48.9	38.8	42.3	45.9	7	6.5	6	8.5	43.5	112	124	136	5	7	0
36 FT	19	21	12	7	6.5	6	6	48.9	39.3	42.9	46.5	7	6.5	6	8	43.5	113	125	137	5	7	0
38 FT	19	21	13	7	6	6	6	49.3	39.3	42.9	46.5	7	6.5	6	8	43.9	113	125	137	5	7	0
40 FT	20	22	13	7	6	6	6.5	49.3	41.3	45.0	48.6	7	6.5	6	8	43.9	114	126	138	5	6.5	0
42 FT	21	23	13	7	6	6	6	49.3	41.9	45.6	49.3	7	6.5	6	8	43.9	115	127	139	5	6.5	0
44 FT	21	23	14	7	6	6	6	49.6	41.9	45.6	49.3	7	6	6	7.5	44.3	115	127	139	5	6.5	0
46 FT	22	24	14	7	6	6	6.5	49.6	42.5	46.3	49.9	7	6	6	8	45.5	116	128	140	5	6	0
48 FT	23	25	14	8	7.5	6	6.5	49.6	43.1	46.8	50.5	7	6	6	8	45.5	117	129	141	5	6	0
50 FT	23	25	14	8	7	6	6	49.6	43.1	46.8	50.5	7	6	6	7.5	45.5	117	129	141	5	6	0

GENERAL NOTES:

IF DESIGN FILLES.

IF DESIGN FILLES.

FILE THE PROBLEM FI

SPECIAL DESIGNS ARE REQUIRED WHEN THE DESIGN FILL IS LESS THAN 1 FOOT OR GREATER THAN 50 FEET.

DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.

DESIGN FILLS ARE MEASURED FROM THE TOP OF TOP SLAB TO THE TOP OF EARTH FILL OR ROADWAY.

CULVERTS MEET STRENGTH AND SERVICEABILITY REQUIREMENTS FOR THE DESIGN VEHICULAR LIVE LOAD HL-93 MINUS THE LANE LOAD.



105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)



CONCRETE SINGLE BOX CULVERT

MEMBER THICKNESS BAR SIZE, SPACING & DIMENSIONS

SPAN (S): 10 FEET HEIGHT (HT): 5 THRU 13 FEET

DATE EFFECTIVE: 04/01/2011 DATE PREPARED:

4/18/2011

703.17

				SF	AN (S)	= 11	FT		HE	EIGHT	(HI) =	6 F	T OR	7 FT	OR	3 FT				
		EMBE					TOP	SLAB E	BARS					E	BOTTON	/ SLAB	BARS			WAL	L BAF	RS
DESIGN	THI	CKNE	SS	A1	BARS			J3	BARS			A2	BARS			J4	BARS			Ba	2 BARS	5
FILL	TS	BS	TX	SIZE	SPA.	SIZE	SPA.	C1	HT=6'	K2 HT=7'	HT=8′	SIZE	SPA.	SIZE	SPA.	C4	HT=6'	K3 HT=7'	HT=8′	SIZE	SPA.	G1
1 FT	12	10	8	6	7.5	5	7	82.6	32.0	36.4	40.6	6	8	6	7.5	61.6	78	90	102	5	12	12
2 FT	12	10	8	6	7.5	5	6.5	82.6	32.0	36.4	40.6	6	7.5	6	7	53.3	78	90	102	5	12	12
4 FT	9	10	8	6	7	6	6.5	46.3	29.3	33.4	37.4	6	7	6	7.5	46.3	78	90	102	5	12	0
6 FT	9	10	8	6	7	6	6.5	43.4	29.3	33.4	37.4	6	6.5	6	6.5	42.0	78	90	102	5	12	0
8 FT	9	10	8	6	6.5	6	6	42.0	33.5	38.3	42.9	6	6	6	6	40.6	78	90	102	5	12	0
10 FT	10	11	8	6	6.5	6	6.5	39.3	30.8	35.0	39.3	7	8	6	7	37.8	79	91	103	5	12	0
12 FT	10	11	8	6	6.5	6	6.5	37.8	30.8	35.0	39.3	6	6	6	7	35.0	79	91	103	5	12	0
14 FT	10	11	8	7	7.5	6	6	36.4	34.4	39.0	43.6	7	7	6	6	35.0	79	91	103	5	12	0
16 FT	11	13	8	7	7	6	6	36.4	31.9	36.0	40.3	7	7	5	6.5	30.8	81	93	105	5	12	0
18 FT	11	14	8	7	6	7	6	39.3	31.3	35.4	39.5	7	6.5	5	7	29.4	82	94	106	5	12	0
20 FT	13	15	8	7	6.5	6	6.5	33.6	33.3	37.5	41.6	7	6.5	5	7	29.4	83	95	107	5	12	0
22 FT	14	16	8	7	6	6	6.5	33.6	34.9	39.3	43.5	7	6.5	5	7	29.4	84	96	108	5	12	0
24 FT	15	17	8	7	6	6	6.5	39.3	35.6	40.0	44.3	7	6.5	5	6.5	29.4	85	97	109	5	12	0
26 FT	16	18	8	7	6	6	6.5	37.8	36.4	40.6	45.0	7	6.5	5	6.5	29.4	86	98	110	5	10	0
28 FT	17	19	8	8	7.5	6	6.5	37.8	37.1	41.4	45.8	7	6	5	6.5	29.4	87	99	111	5	9.5	0
30 FT	18	20	8	8	7.5	6	6	37.8	38.9	43.3	47.8	7	6	5	6	29.4	88	100	112	5	9.5	0
32 FT	19	21	9	8	7.5	6	7	39.5	39.6	44.0	48.5	7	6	5	6.5	29.6	89	101	113	5	9	0
34 FT	20	22	10	8	7.5	6	8	39.8	40.4	44.8	49.3	7	6	5	7	31.3	90	102	114	5	10	0
36 FT	21	23	10	8	7.5	6	8	39.8	41.1	45.5	50.0	7	6	5	6.5	31.3	91	103	115	5	9	0
38 FT	22	23	10	8	7	6	8	39.8	42.5	47.1	51.6	8	7.5	5	6.5	31.3	91	103	115	5	8	0
40 FT	22	24	11	8	7	6	7	40.0	43.0	47.5	52.0	8	7.5	5	7	31.5	92	104	116	5	9	0
42 FT	23	25	11	8	7	6	8	40.0	43.8	48.3	52.9	8	7.5	5	7	31.5	93	105	117	5	8.5	0
44 FT	24	26	11	8	7	6	8	40.0	44.5	49.0	53.6	8	7.5	5	6.5	31.5	94	106	118	5	7.5	0
46 FT	25	26	11	8	6.5	6	8	40.0	46.0	50.8	55.4	8	7	5	6.5	31.5	94	106	118	5	7.5	0
48 FT	25	27	11	8	6.5	6	7.5	40.0	45.3	49.8	54.4	8	7	5	6	31.5	95	107	119	5	7.5	0
50 FT	26	27	11	8	6.5	6	8	40.0	46.8	51.5	56.1	8	7	5	6	31.5	95	107	119	5	7.5	0

48 FT	25	27	11	8	6.5	6	7.5	40.0	45.3	49.8	54.4	8	7	5	6	31.5	95	107	119	5	7.5	0
50 FT	26	27	11	8	6.5	6	8	40.0	46.8	51.5	56.1	8	7	5	6	31.5	95	107	119	5	7.5	0
																						_
				SPA	N (S	()	11	FT		HE:	GHT	(HT)	= 1	2 F	T OR	13 F	T OR	14 F	T			
		EMBE					TOP	SLAB E	BARS						вотток	SLAB	BARS			WAI	L BAF	₹S
DESIGN	THI	CKNE	SS	A1	BARS			J3	BARS			A2	BARS			J4	BARS			В:	2 BARS	5
FILL	TS	BS	ТX	SIZE	SPA.	SIZE	SPA.	C1		K2		SIZE	SPA.	C 1 7F	SPA.	C4		К3		SIZE	SPA.	G1
	13	03	٠,	SIZE	JF A.	JIZE	JI A.	5	HT=12'			3120	31 A.	SIZE	JI A.	CT.		HT=131		SIZE	JI A.	
1 FT	12	12	9	6	7.5	6	7	86.0	32.6	35.0	37.4	6	7.5	6	6	86.0	152	164	176	5	8.5	12
2 FT	12	12	9	6	7	6	6.5	86.0	34.3	36.8	39.3	6	7	6	6	86.0	152	164	176	5	8	12
4 FT	9	11	10	6	7	6	6	86.6	33.4	35.9	38.4	6	6.5	6	6	86.6	151	163	175	5	7.5	0
6 FT	9	12	10	6	7.5	6	6	86.6	33.6	36.1	38.6	6	6.5	6	6	88.0	152	164	176	5	7	0
8 FT	10	13	10	6	7.5	6	6	86.6	34.0	36.5	39.0	6	7	6	6	86.6	153	165	177	5	6.5	0
10 FT	10	13	11	6	7	6	6	70.1	34.0	36.5	39.0	6	6.5	6	6.5	88.6	153	165	177	5	6.5	0
12 FT	10	13	11	6	7.5	6	6	60.0	32.4	34.8	37.3	6	6.5	6	6.5	74.4	153	165	177	5	7.5	0
14 FT	11	13	11	6	6.5	6	6	60.0	35.9	38.5	41.1	6	6	6	6	70.1	153	165	177	5	7	0
16 FT	12	14	12	6	6.5	6	7	60.5	36.3	39.0	41.6	7	8	6	6.5	67.6	154	166	178	5	7	0
18 FT	13	15	13	6	6	6	7	59.5	38.4	41.1	43.9	7	7.5	6	7	65.3	155	167	179	5	6.5	0
20 FT	14	16	13	6	6	6	6.5	60.9	38.9	41.6	44.4	7	7.5	6	6.5	66.8	156	168	180	5	6.5	0
22 FT	14	17	14	7	7.5	6	6.5	59.9	39.1	41.9	44.6	7	7	6	6.5	64.3	157	169	181	5	6	0
24 FT	15	17	14	7	7	6	6	65.8	39.4	42.1	44.9	7	6.5	6	6	64.3	157	169	181	5	6	0
26 FT	16	18	15	7	7	6	6	66.1	41.5	44.4	47.3	7	6.5	6	6	63.3	158	170	182	6	8	0
28 FT	17	19	15	7	7	6	6	66.1	42.0	44.9	47.8	7	6.5	6	6	64.6	159	171	183	6	8	0
30 FT	18	20	16	7	7	6	6	66.6	42.5	45.4	48.3	7	6.5	6	6	63.6	160	172	184	6	8	0
32 FT	19	21	16	7	6.5	7	8	72.5	44.8	47.8	50.8	7	6.5	7	8	68.1	161	173	185	6	8	0
34 FT	20	22	16	7	6.5	7	7	72.5	45.3	48.3	51.3	7	6.5	7	7	68.1	162	174	186	6	8	0
36 FT	20	22	17	7	6	7	7.5	71.5	50.6	54.0	57.4	7	6	7	7	67.0	162	174	186	6	7.5	0
38 FT	21	23	18	7	6	7	7.5	72.0	45.8	48.8	51.8	7	6	7	7.5	67.5	163	175	187	6	7	0
40 FT	22	24	18	7	6	7	7	73.5	46.3	49.3	52.3	7	6	7	7.5	69.0	164	176	188	6	7	0
42 FT	23	25	19	7	6	7	7.5	74.0	48.6	51.8	54.9	7	6	7	8	68.0	165	177	189	6	6.5	0
44 FT	23	26	20	7	6	7	7.5	73.0	47.0	50.0	53.0	7	6	6	6	65.4	166	178	190	6	6.5	0
46 FT	24	26	20	8	7.5	7	7	73.0	49.1	52.3	55.4	8	7.5	7	7.5	68.4	166	178	190	6	6.5	0
48 FT	25	27	21	8	7.5	7	7.5	73.5	49.6	52.8	55.9	8	7.5	7	8	68.9	167	179	191	6	6	0
50 FT	25	27	21	8	7	7	7	73.5	49.6	52.8	55.9	8	7	7	7	68.9	167	179	191	6	6	0

	J3 BAR	P1	BAR —	
		ALTERI	NATE J	3 BA
USE IN	CONTRACTOR'S ED WHEN THE D THE TOP SLAE OT C1) SHALL	DISTANCE B IS LESS	BETWEEN THAN 2	THE -0".

AT CONTRACTOR'S OPTION. ALTERNATE J3 BARS MAY BE USED WHEN THE DISTANCE BETWEEN THE ENDS OF J3 BARS 10 DISTANCE BETWEEN THE ENDS OF J3 BARS 10 DISTANCE BETWEEN THE ENDS OF J3 BARS 10 DISTANCE BE USED WITH ALTERNATE MAY BE ALTERNATE MAY BE M

				SPA	N (S	5) =	11	FT		HE	GHT	(HT:	= 9	FT	OR	10 FT	OR	11 FT				=
	М	EMBE	R				TOP	SLAB	BARS					- 6	зотто	/ SLAB	BARS			WA	L BA	สร
DESIGN	TILL	CKN		A1	BARS			J3	BARS			A2	BARS			J4	BARS			В	2 BAR	5
FILL	TS	BS	тх	SIZE	SPA.	C 1.75	SPA.	C1		K2		SIZE	SPA.	C 1 7 F	SPA.	C4		К3		SIZE	SPA.	G1
	15	В5	' ×	SIZE	SPA.	SIZE	SPA.	CI	HT=9'	HT=10'	HT=11'	SIZE	SPA.	SIZE	SPA.	C4	HT=9'	HT=10'	HT=11'	SIZE	SPA.	61
1 FT	12	11	8	6	7.5	5	7	82.6	32.8	35.9	39.0	6	7.5	6	6.5	85.4	115	127	139	5	9.5	12
2 FT	12	11	8	6	7	5	6.5	82.6	32.8	35.9	39.0	6	7	6	6	85.4	115	127	139	5	9.5	12
4 FT	9	10	9	6	7	6	6.5	70.5	34.1	37.5	40.9	6	6.5	6	6	73.4	114	126	138	5	9.5	0
6 FT	9	11	9	6	7.5	6	6	57.8	30.8	33.8	36.8	6	6.5	6	6	64.9	115	127	139	5	9.5	0
8 FT	9	11	9	6	7	7	6.5	56.4	30.8	33.8	36.8	6	6	6	6	56.4	115	127	139	5	9	0
10 FT	10	12	9	6	6.5	6	6	50.8	31.3	34.3	37.3	6	6	6	6	55.0	116	128	140	5	8.5	0
12 FT	10	12	9	6	6.5	6	6	46.5	31.3	34.3	37.3	6	6	6	6	48.0	116	128	140	5	10	0
14 FT	11	12	9	6	6	6	6.5	45.1	35.3	38.6	42.0	7	7.5	6	6	46.5	116	128	140	5	9	0
16 FT	11	13	10	7	7.5	6	6	45.5	33.0	36.1	39.3	7	7	6	6.5	46.9	117	129	141	5	9.5	0
18 FT	12	14	10	7	7	6	6.5	45.5	32.3	35.3	38.3	7	7	6	6.5	45.5	118	130	142	5	8.5	0
20 FT	13	15	10	7	7	6	6	45.5	34.0	37.1	40.3	7	6.5	6	6.5	45.5	119	131	143	5	8	0
22 FT	14	16	11	7	7	6	6.5	45.8	35.9	39.1	42.4	7	6.5	6	7.5	45.8	120	132	144	5	8	0
24 FT	15	17	11	7	6.5	6	6	51.5	36.5	39.8	42.9	7	6.5	6	7.5	45.8	121	133	145	5	7.5	0
26 FT	16	18	12	7	6.5	6	6.5	51.9	37.0	40.3	43.5	7	6.5	6	8	46.1	122	134	146	5	7.5	0
28 FT	17	19	12	7	6.5	6	6.5	51.9	37.5	40.8	44.0	7	6.5	6	7.5	46.1	123	135	147	5	7	0
30 FT	18	20	13	7	6.5	6	6.5	52.3	38.1	41.3	44.5	7	6.5	6	8	46.4	124	136	148	5	7.5	0
32 FT	19	21	13	7	6	6	6.5	52.3	40.0	43.4	46.8	7	6	6	7.5	46.4	125	137	149	5	6.5	0
34 FT	20	22	13	7	6	6	6	52.3	40.6	44.0	47.4	7	6	6	7.5	46.4	126	138	150	5	6.5	0
36 FT	21	22	13	7	6	6	6	52.3	45.3	49.0	52.8	7	6	6	6.5	46.4	126	138	150	5	6.5	0
38 FT	21	23	14	8	7.5	6	6	52.5	41.1	44.5	47.9	7	6	6	7.5	46.8	127	139	151	5	6	0
40 FT	22	24	14	8	7.5	6	6	52.5	43.3	46.8	50.1	8	7.5	6	7	48.1	128	140	152	5	6	0
42 FT	23	25	15	8	7.5	6	6.5	52.9	48.4	52.1	56.0	8	7.5	6	7.5	48.5	129	141	153	5	6	0
44 FT	24	25	15	8	7	6	6.5	52.9	48.6	52.5	56.4	8	7	6	6.5	48.5	129	141	153	6	8	0
46 FT	24	26	15	8	7	6	6	52.9	49.0	52.8	56.6	8	7	6	7	48.5	130	142	154	6	8	0
48 FT	25	27	16	8	7	6	6	53.3	49.6	53.5	57.3	8	7	6	7.5	48.9	131	143	155	6	8	0
50 FT	26	27	16	8	6.5	6	6	53.3	51.5	55.5	59.4	8	7	6	6.5	48.9	131	143	155	6	8	0

GENERAL NOTES:

IF DESIGN FILLES.

IF DESIGN FILLES.

FILE THE PROBLEM FI

SPECIAL DESIGNS ARE REQUIRED WHEN THE DESIGN FILL IS LESS THAN 1 FOOT OR GREATER THAN 50 FEET.

DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.

DESIGN FILLS ARE MEASURED FROM THE TOP OF TOP SLAB TO THE TOP OF EARTH FILL OR ROADWAY.

CULVERTS MEET STRENGTH AND SERVICEABILITY REQUIREMENTS FOR THE DESIGN VEHICULAR LIVE LOAD HL-93 MINUS THE LANE LOAD.



MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)



CONCRETE SINGLE BOX CULVERT

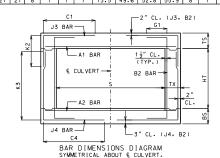
MEMBER THICKNESS BAR SIZE, SPACING & DIMENSIONS

SPAN (S): 11 FEET HEIGHT (HT): 6 THRU 14 FEET

DATE EFFECTIVE: 04/01/2011 DATE PREPARED:

4/18/2011

703.17

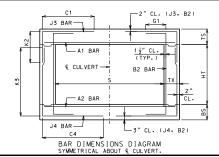


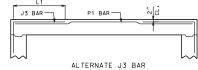
					ANI (· C \	_ 10	ΕТ		110	LCUIT	/ 117	٠, _	C F	T 00	7 61	0.0	8 FT				_
				- SF	AN (. 51	= 12			н	IGHT	(H)) =			7 FT		8 FT		T		
		EMBE					TOP	SLAB I							BOTTON		BARS			WAL		
DESIGN	IH.	CKNE	:55	A1	BARS			J 3	BARS			A2	BARS			J4	BARS			Ba	2 BARS	3
FILL	TS	BS	ТХ	SIZE	SPA.	S I 7F	SPA.	C1		K2		S 1 7 F	SPA.	SIZE	SPA.	C4		К3		SIZE	SPA.	G1
									HT=6'	HT=7'	HT=8'						HT=6'	HT=7'	HT=8'			-
1 FT	13	10	8	6	7.5	5	8.5	89.6	33.3	37.8	42.1	6	7.5	6	6.5	57.8	78	90	102	5	12	12
2 FT	14	10	8	6	7	5	8.5	89.6	34.6	39.1	43.8	6	7	6	6	51.6	78	90	102	5	12	12
4 FT	10	11	8	6	6.5	6	6.5	47.1	30.8	35.0	39.3	6	6.5	5	6.5	42.5	79	91	103	5	12	0
6 FT	10	11	8	6	6.5	6	6.5	44.1	30.8	35.0	39.3	6	6	5	6	39.5	79	91	103	5	12	0
8 FT	10	11	8	6	6	6	6.5	41.0	30.8	35.0	39.3	7	7.5	6	6.5	39.5	79	91	103	5	12	0
10 FT	10	11	8	7	7	7	6	42.5	34.4	39.0	43.6	7	6.5	6	6	38.0	79	91	103	5	12	0
12 FT	11	12	8	7	7	6	6	38.0	35.1	39.8	44.5	7	6.5	6	6.5	36.5	80	92	104	5	12	0
14 FT	11	13	8	7	7	6	6	36.5	31.9	36.0	40.3	7	6.5	5	7	30.4	81	93	105	5	12	0
16 FT	12	14	8	7	6.5	6	6	35.0	32.5	36.8	41.0	7	6.5	5	7	30.4	82	94	106	5	12	0
18 FT	13	15	8	7	6	6	6.5	33.5	33.3	37.5	41.6	7	6	5	6.5	30.4	83	95	107	5	12	0
20 FT	15	17	8	7	6	6	7	39.5	35.6	40.0	44.3	7	6.5	5	7	30.4	85	97	109	5	12	0
22 FT	16	18	8	7	6	6	7	39.5	36.4	40.6	45.0	7	6	5	6.5	30.4	86	98	110	5	12	0
24 FT	17	19	8	8	7.5	6	7	39.5	37.1	41.4	45.8	7	6	5	6.5	30.4	87	99	111	5	11	0
26 FT	18	20	8	8	7	6	7	39.5	38.9	43.3	47.8	7	6	5	6	30.4	88	100	112	5	9.5	0
28 FT	19	21	8	8	7	6	7	39.5	39.6	44.0	48.5	7	6	6	7.5	33.5	89	101	113	5	9.5	0
30 FT	20	21	8	8	7	6	6.5	39.5	44.3	49.3	54.1	8	7	6	7.5	33.5	89	101	113	5	9.5	0
32 FT	21	23	9	8	7	6	7.5	39.8	41.1	45.5	50.0	8	7.5	5	6	30.6	91	103	115	5	8.5	0
34 FT	22	23	9	8	6.5	6	7.5	39.8	42.5	47.1	51.6	8	7	5	6	30.6	91	103	115	5	8.5	0
36 FT	23	24	9	8	6.5	6	7	39.8	47.9	52.9	58.0	8	7	6	7	33.6	92	104	116	5	8.5	0
38 FT	24	25	9	8	6.5	6	6.5	39.8	48.8	53.8	58.8	8	7	6	7	33.6	93	105	117	5	8.5	0
40 FT	24	26	10	8	6	6	7	40.0	44.5	49.0	53.6	8	7	5	6	30.8	94	106	118	5	8	0
42 FT	25	27	10	8	6	6	7	40.0	45.3	49.8	54.4	8	7	6	7	33.9	95	107	119	5	8	0
44 FT	26	27	10	8	6	6	7	40.0	50.4	55.5	60.5	8	6.5	6	7	33.9	95	107	119	5	8	0
46 FT	27	28	10	8	6	6	7	40.0	51.3	56.3	61.4	8	6.5	6	7	33.9	96	108	120	5	7.5	0
48 FT	28	29	11	8	6	6	7.5	40.3	52.1	57.1	62.1	8	6.5	6	7.5	34.1	97	109	121	5	7.5	0
50 FT	28	30	11	- 8	6	6	7.5	40.3	52.5	57.5	62.6	- 8	6.5	6	7	34.1	98	110	122	5	7.5	0

				SPA	N (S	5) =	12	FT		HE I	GHT	(HT:	= 9	FT	OR	10 FT	OR :	11 FT				\neg
		EMBE					TOP	SLAB E	BARS					E	вотто	/ SLAB	BARS			WAL	L BAF	RS
DESIGN	THI	CKNE	ESS	A1	BARS			J3	BARS			A2	BARS			J4	BARS			B2	BAR	S
FILL	TS	BS	тх	S 1 7F	SPA.	S 1 7F	SPA.	C1		K2		SIZE	SPA.	SIZE	SPA.	C4		К3		SIZE	SPA.	G1
								-		HT=10'					G	-		HT=10'				
1 FT	11	12	8	6	6.5	6	7	91.3	31.5	34.5	37.5	6	7.5	6	7	91.3	116	128	140	5	10	12
2 FT	11	12	8	6	6	6	6.5	91.3	31.5	34.5	37.5	6	7	6	6.5	91.3	116	128	140	5	9.5	12
4 FT	10	12	8	6	6	6	6	69.9	30.0	32.9	35.8	6	6.5	6	6.5	83.6	116	128	140	5	9.5	0
6 FT	10	12	8	6	6.5	6	6	57.8	31.3	34.3	37.3	6	6	6	6	62.4	116	128	140	5	9.5	0
8 FT	10	12	9	6	6	6	6	52.0	31.3	34.3	37.3	7	8	6	6	55.1	116	128	140	5	10	0
10 FT	10	12	9	7	7.5	7	6	52.0	35.0	38.4	41.8	7	7	6	6	50.5	116	128	140	5	9.5	0
12 FT	11	13	10	7	7.5	6	6	49.3	33.0	36.1	39.3	7	7	6	6.5	49.3	117	129	141	5	10	0
14 FT	11	13	10	7	7.5	6	6	46.3	31.8	34.8	37.8	7	7	6	6.5	46.3	117	129	141	5	12	0
16 FT	12	14	10	7	7	6	6.5	46.3	32.3	35.3	38.3	7	6.5	6	7	44.6	118	130	142	5	11	0
18 FT	13	15	10	7	6.5	6	6	44.6	38.0	41.5	45.0	7	6	6	7	44.6	119	131	143	5	9.5	0
20 FT	14	16	10	7	6	7	7.5	47.8	38.6	42.0	45.5	7	6	6	6.5	44.6	120	132	144	5	8.5	0
22 FT	16	18	11	7	6.5	6	6.5	51.1	37.0	40.3	43.5	7	6.5	6	7.5	45.0	122	134	146	5	8.5	0
24 FT	17	19	11	7	6	6	6	49.6	37.5	40.8	44.0	7	6	6	7.5	45.0	123	135	147	5	7.5	0
26 FT	18	20	12	7	6	6	6.5	49.9	38.1	41.3	44.5	7	6	6	7.5	45.3	124	136	148	5	8	0
28 FT	19	21	12	7	6	6	6	49.9	40.0	43.4	46.8	7	6	6	7.5	45.3	125	137	149	5	7	0
30 FT	20	22	13	8	7.5	6	6.5	51.8	40.6	44.0	47.4	7	6	6	8	45.5	126	138	150	5	7.5	0
32 FT	21	23	13	8	7.5	6	6	50.3	41.1	44.5	47.9	8	7.5	6	7.5	45.5	127	139	151	5	7	0
34 FT	21	23	13	8	7	6	6	50.3	45.6	49.3	53.0	8	7	6	7	45.5	127	139	151	5	6.5	0
36 FT	22	24	14	8	7	6	6	52.1	43.3	46.8	50.1	8	7	6	7.5	45.9	128	140	152	5	7	0
38 FT	23	25	14	8	6.5	6	6	50.5	43.8	47.3	50.8	8	7	6	7.5	45.9	129	141	153	5	6	0
40 FT	24	26	14	8	6.5	6	6	50.5	44.4	47.9	51.4	8	7	6	7	45.9	130	142	154	5	6	0
42 FT	25	27	15	8	6.5	6	6	52.5	49.6	53.5	57.3	8	7	6	7.5	46.1	131	143	155	5	6	0
44 FT	26	28	15	8	6.5	6	6	52.5	50.3	54.1	57.9	8	6.5	6	7.5	47.8	132	144	156	6	8	0
46 FT	27	28	15	8	6.5	6	6	50.9	52.1	56.1	60.0	8	6.5	6	7	47.8	132	144	156	6	8	0
48 FT	27	29	15	8	6	6	6	52.5	52.5	56.4	60.4	8	6.5	6	7	47.8	133	145	157	6	8	0
50 FT	28	30	16	8	6	6	6	52.8	53.1	57.1	61.0	8	6.5	6	7.5	48.0	134	146	158	6	8	0

				SPAN	V (S) =	12 F	Т		HE I	GHT	(HT) =	12 F	T OR	13 F	T			\neg
	М	EMBE	R			T	DP SL	AB BAR	S				BOT:	TOM SI	LAB BA	RS		WAL	L BAF	RS
DESIGN	TH	CKN	ESS	A1	BARS			J3 BA	RS		Α2	BARS			J4 BA	RS		Ba	2 BARS	S
FILL	TS	вѕ	ТХ	SIZE	SPA.	SIZE	SPA.	C1	HT=12'	2 HT=13'	SIZE	SPA.	SIZE	SPA.	C4	HT=12		SIZE	SPA.	G1
1 FT	12	11	9	6	6.5	5	6	90.3	32.4	34.8	6	6.5	6	6	91.8	151	163	5	8.5	12
2 FT	12	11	9	6	6.5	6	7	91.8	34.0	36.5	6	6.5	6	6	91.8	151	163	5	8.5	12
4 FT	10	12	9	6	6.5	6	6	91.8	35.4	38.0	6	6.5	6	6	91.8	152	164	5	8.5	0
6 FT	10	12	9	6	6.5	7	6.5	81.1	35.4	38.0	6	6	6	6	91.8	152	164	5	8	0
8 FT	10	12	10	6	6.5	6	6	64.6	35.4	38.0	7	7.5	6	6	73.9	152	164	5	8	0
10 FT	11	13	10	6	6	6	6	61.6	35.9	38.5	7	7.5	6	6	69.3	153	165	5	8	0
12 FT	12	13	11	6	6	6	7	58.9	36.1	38.8	7	7	6	6	62.0	153	165	5	7.5	0
14 FT	12	13	11	6	6	6	7	54.3	36.1	38.8	7	7	6	6	55.8	153	165	5	7.5	0
16 FT	12	14	11	7	7	6	6	52.8	36.3	39.0	7	6.5	6	6.5	55.8	154	166	5	7.5	0
18 FT	13	16	12	7	7	6	6	53.0	38.6	41.4	7	6.5	6	7	56.1	156	168	5	7	0
20 FT	14	16	12	7	6.5	6	6	53.0	38.9	41.6	7	6	6	6	54.6	156	168	5	7	0
22 FT	16	18	13	7	6.5	6	6	59.6	41.5	44.4	7	6.5	6	7	55.0	158	170	5	6.5	0
24 FT	16	19	13	7	6	7	7	64.4	40.0	42.8	7	6	6	6.5	55.0	159	171	5	6.5	0
26 FT	18	20	14	7	6.5	6	6	58.5	42.5	45.4	7	6	6	6.5	55.3	160	172	5	6	0
28 FT	18	21	14	7	6	7	7	63.3	42.8	45.6	7	6	6	6.5	55.3	161	173	5	6	0
30 FT	19	22	14	8	7.5	7	6.5	63.3	43.3	46.1	7	6	6	6	55.3	162	174	5	6	0
32 FT	20	23	15	8	7.5	7	7.5	63.6	45.5	48.5	8	7.5	6	6.5	55.6	163	175	6	8	0
34 FT	21	23	15	8	7	7	7	63.6	45.8	48.8	8	7	6	6	55.6	163	175	6	8	0
36 FT	22	24	16	8	7	7	7.5	64.0	46.3	49.3	8	7	6	6.5	56.0	164	176	6	8	0
38 FT	23	25	16	8	7	7	7	64.0	48.6	51.8	8	7	6	6	56.0	165	177	6	8	0
40 FT	24	26	17	8	7	7	7.5	64.4	49.1	52.3	8	7	6	6.5	56.4	166	178	6	7.5	0
42 FT	24	27	17	8	6.5	7	6.5	64.4	49.4	52.5	8	7	6	6	56.4	167	179	6	7.5	0
44 FT	25	28	18	8	6.5	7	7	66.4	49.9	53.0	8	7	6	6.5	56.8	168	180	6	7	0
46 FT	26	28	18	8	6.5	7	7	66.4	50.1	53.3	8	6.5	6	6	56.8	168	180	6	7	0
48 FT	27	29	19	8	6.5	7	7.5	66.9	52.6	55.9	8	6.5	6	6.5	57.0	169	181	6	6.5	0
50 FT	28	30	19	8	6.5	7	7	66.9	53.3	56.4	8	6.5	6	6	57.0	170	182	6	6.5	0

				SPAI	۷ (S) =	12 F	Т		HE I	GHT	(HT) =	14 F	T OR	15 F	T			
		EMBE				T (OP SL	AB BAR	S				BOT	TOM SI	LAB BA	RS		₩AL	L BAF	₹S
DESIGN	TH:	ICKN	SS	A1	BARS			J3 B4	RS		A2	BARS			J4 BA	RS		Ba	2 BARS	3
FILL	TS	BS	ТX	SIZE	SPA.	SIZE	SPA.	C1	K HT=14'	2 HT=15'	SIZE	SPA.	SIZE	SPA.	C4	K HT=14		SIZE	SPA.	G1
1 FT	12	12	10	6	7	6	7.5	94.0	35.5	37.8	6	7	6	6.5	94.0	176	188	5	7.5	12
2 FT	12	12	10	6	6.5	6	7	94.0	37.4	39.8	6	6.5	6	6	94.0	176	188	5	7.5	12
4 FT	10	13	10	6	6.5	6	6	94.0	35.4	37.6	6	6.5	6	6	94.0	177	189	5	6.5	0
6 FT	10	13	11	6	7	6	6.5	94.5	35.4	37.6	6	6.5	6	6.5	94.5	177	189	5	6.5	0
8 FT	10	13	11	6	6.5	6	6	85.3	35.4	37.6	6	6	6	6	94.5	177	189	5	6	0
10 FT	11	13	12	6	6.5	6	6.5	74.9	35.5	37.8	7	7.5	6	6	95.1	177	189	5	6	0
12 FT	12	14	13	6	6.5	6	7	70.6	37.8	40.3	7	7.5	6	6.5	83.3	178	190	5	6	0
14 FT	12	14	13	6	6.5	6	7	62.8	37.8	40.3	7	7.5	6	6.5	69.1	178	190	5	6.5	0
16 FT	13	15	13	6	6	6	6.5	64.4	38.3	40.6	7	7	6	6.5	70.6	179	191	5	6.5	0
18 FT	14	16	14	7	7.5	6	6.5	63.3	38.6	41.0	7	7	6	6.5	68.0	180	192	5	6	0
20 FT	15	17	14	7	7	6	6	69.5	39.0	41.4	7	6.5	6	6	68.0	181	193	5	6	0
22 FT	16	18	15	7	7	6	6	70.0	41.4	43.9	7	6.5	6	6.5	68.4	182	194	6	8	0
24 FT	16	19	15	7	6.5	7	7	73.1	41.6	44.1	7	6	6	6	68.4	183	195	6	8	0
26 FT	17	20	16	7	6.5	7	7	73.6	42.0	44.5	7	6	6	6	67.3	184	196	6	8	0
28 FT	18	21	16	7	6	7	7	75.3	46.5	49.3	7	6	7	7.5	72.0	185	197	6	8	0
30 FT	19	22	17	7	6	7	7	74.0	46.9	49.6	7	6	7	7.5	70.9	186	198	6	7.5	0
32 FT	20	23	17	7	6	7	6.5	75.6	47.4	50.1	7	6	7	7	70.9	187	199	6	7.5	0
34 FT	21	23	18	8	7.5	7	7	74.5	51.8	54.8	8	7.5	7	6.5	71.3	187	199	6	7	0
36 FT	22	24	19	8	7.5	7	7.5	75.0	52.3	55.3	8	7.5	7	7	70.1	188	200	6	6.5	0
38 FT	23	25	19	8	7.5	7	6.5	76.6	50.6	53.5	8	7	7	7	71.8	189	201	6	6.5	0
40 FT	24	26	20	8	7	7	7	75.5	51.1	54.0	8	7	7	7.5	70.5	190	202	6	6.5	0
42 FT	25	27	20	8	7	7	6.5	77.1	53.8	56.8	8	7	7	7	72.1	191	203	6	6.5	0
44 FT	25	28	21	8	7	7	6.5	75.9	54.0	57.0	8	7	7	7.5	72.6	192	204	6	6	0
46 FT	26	28	22	8	6.5	7	7	76.4	56.4	59.5	8	6.5	7	7	71.4	192	204	6	6	0
48 FT	27	29	22	8	6.5	7	6.5	76.4	59.1	62.4	8	6.5	7	6.5	71.4	193	205	6	6	0
50 FT	27	30	23	8	6.5	7	6.5	76.9	57.3	60.4	8	6.5	7	7	71.8	194	206	7	7.5	0





ALTERNATE J3 BAR AT CONTRACTOR'S OPTION. ALTERNATE J3 BARS MAY BE USED WHEN THE DISTANCE BETWEEN THE ENDS OF J3 BARS IN THE TOPS LAB 15 LESS THAN 2 -0 "OF DIMENSION L1 IN THE TOPS LAB 15 LESS THAN 2 -0 "OF DIMENSION L1 IN THE L2 "AND 28" FOR "44. "5 AND "68 BARS. RESPECTIVELY. ADDITIONAL PIB BARS ARE REQUIRED WITH ALTERNATE J3 BARS WITH LENGTH COULT TO J1 BARS. AND SIZE AND SPATIA LENGTH BARS ARE GOULTED AT J3 BARS. WITH J4 BARS. AND L2 AND STATUS AND L2 AND SPATIAL COURT J3 BARS. NO ADDITIONAL PAYMENT WILL BE MADE FOR THIS SUBSTITUTION.

GENERAL NOTES:

GENERAL NOTES:

IF DESIGN FILL IS BETWEEN TABULATED DESIGN FILLS, USE HEE NEXT ORGATER TABULATED DESIGN FILLT EXCEPT OF THE NEXT ORGATER THE NEXT ORGATER THE NEXT ORGATER NEXT OF THE NEX

SPECIAL DESIGNS ARE REQUIRED WHEN THE DESIGN FILL IS LESS THAN 1 FOOT OR GREATER THAN 50 FEET.

DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.

DESIGN FILLS ARE MEASURED FROM THE TOP OF TOP SLAB TO THE TOP OF EARTH FILL OR ROADWAY.

CULVERTS MEET STRENGTH AND SERVICEABILITY REQUIREMENTS FOR THE DESIGN VEHICULAR LIVE LOAD HL-93 MINUS THE LANE LOAD.



MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)



CONCRETE SINGLE BOX CULVERT

MEMBER THICKNESS BAR SIZE, SPACING & DIMENSIONS

SPAN (S): 12 FEET HEIGHT (HT): 6 THRU 15 FEET

DATE EFFECTIVE: DATE PREPARED: 04/01/2011 4/18/2011 703.17

17 | SHEET NO. 10 OF 14

				SF	AN (S)	= 13	FT		НЕ	IGHT	(H)) =	7 F	T OR	8 FT	OR 9	9 FT				
	l.	EMBE	R				TOP	SLAB E	BARS						BOTTO	/ SLAB	BARS			WAL	L BAF	RS
DESIGN		CKN		A1	BARS			J3	BARS			A2	BARS			J4	BARS			Ba	2 BARS	ŝ
FILL	TS	BS	ТХ	SIZE	SPA.	SIZE	SPA.	C1	HT=7'	K2 HT=8'	нт=9′	SIZE	SPA.	SIZE	SPA.	C4	HT=7'	K3 HT=8'	нт=9′	SIZE	SPA.	G1
1 FT	13	11	8	6	6.5	5	8.5	95.1	34.0	38.0	41.9	6	7	6	7	67.3	91	103	115	5	12	12
2 FT	13	11	8	6	6	5	6.5	95.1	34.0	38.0	41.9	6	6.5	6	6.5	59.0	91	103	115	5	12	12
4 FT	10	11	8	7	7.5	6	6	49.3	31.0	34.8	38.5	6	6	6	6.5	49.3	91	103	115	5	12	0
6 FT	10	11	8	7	7.5	6	6	45.9	34.0	38.1	42.1	7	7	6	6	45.9	91	103	115	5	12	0
8 FT	10	12	8	7	7	7	6	47.5	30.3	33.9	37.5	7	7	6	7	42.6	92	104	116	5	12	0
10 FT	11	12	8	7	6.5	7	6.5	44.3	35.8	39.9	44.1	7	6	6	6	41.0	92	104	116	5	12	0
12 FT	12	13	8	7	6	7	6.5	42.6	36.4	40.6	44.8	7	6	6	6.5	39.4	93	105	117	5	12	0
14 FT	12	14	8	7	6	7	6.5	41.0	32.5	36.3	40.0	7	6	5	6	32.8	94	106	118	5	12	0
16 FT	13	15	8	8	7.5	7	6.5	39.4	33.1	36.9	40.6	7	6	5	6	31.1	95	107	119	5	12	0
18 FT	14	16	8	8	7	7	7	37.8	34.9	38.8	42.5	8	7.5	6	8	34.5	96	108	120	5	12	0
20 FT	15	18	8	8	6.5	7	7	45.9	35.9	39.6	43.5	8	7.5	5	6	31.1	98	110	122	5	11.5	0
22 FT	17	19	8	8	7	6	6	41.0	38.0	41.9	45.9	8	7.5	6	8	34.5	99	111	123	5	9.5	0
24 FT	18	20	8	8	6.5	7	7.5	45.9	38.6	42.6	46.5	8	7	6	7.5	34.5	100	112	124	5	9.5	0
26 FT	19	21	9	8	6.5	6	6	41.3	39.3	43.3	47.3	8	7	5	6	31.4	101	113	125	5	9	0
28 FT	20	22	10	8	6.5	6	6.5	41.5	41.1	45.3	49.3	8	7	5	6	33.3	102	114	126	5	10	0
30 FT	21	23	10	8	6.5	6	6.5	41.5	41.9	45.9	50.0	8	6.5	5	6	33.3	103	115	127	5	9	0
32 FT	22	24	10	8	6	6	6	41.5	42.5	46.6	50.6	8	6.5	5	6	33.3	104	116	128	5	8	0
34 FT	23	25	11	8	6	6	6.5	41.8	43.1	47.3	51.4	8	6.5	5	6.5	33.4	105	117	129	5	8.5	0
36 FT	24	26	11	8	6	6	6.5	41.8	45.1	49.4	53.5	8	6.5	5	6	33.4	106	118	130	5	8	0
38 FT	25	27	12	8	6	6	6.5	42.0	45.9	50.0	54.3	8	6.5	5	6	33.6	107	119	131	5	8.5	0
40 FT	26	28	12	8	6	6	7	42.0	46.5	50.8	55.0	8	6.5	5	6	33.6	108	120	132	5	7.5	0
42 FT	27	29	12	9	7.5	6	7	42.0	51.3	55.9	60.4	8	6	6	8.5	37.0	109	121	133	5	7	0
44 FT	28	30	12	9	7	6	7	42.0	52.0	56.6	61.1	8	6	6	8	37.0	110	122	134	5	7	0
46 FT	29	30	12	9	7	6	7	42.0	53.9	58.5	63.1	8	6	6	7.5	37.0	110	122	134	5	7	0
48 FT	30	31	12	9	7	6	7	42.0	54.6	59.3	64.0	8	6	6	7.5	37.0	111	123	135	5	7	0
150 FT	30	32	12	Ιq	7	16	6.5	42.0	55.0	59.6	64.4	l a	16	6	7.5	37.0	112	124	136	5	7	lο

DESIGN	TH:	CKN	AT BAILS											B2	2 BARS	ا ذ						
FILL	TS	BS	TV	C 1 7F	SPA.	C 1 7F	CDA	C1		K2		C 1 7F	SPA.	C 1 7F	CDA	C4		К3		C 1 7F	SPA.	G1
	13	ВЭ	١٨.	SIZE	SFA.	SIZE	SFA.	C	HT=10'	HT=11'	HT=12'	3126	SFA.	312E	SFA.	- 04	HT=10	′HT=11′	HT=12	3125	SFA.	01
1 FT	12	12	9	6	6.5	5	6	95.8	33.4	36.3	39.1	6	7	6	6.5	99.0	128	140	152	5	9	12
2 FT	12	13	9	6	6	6	7	99.0	32.3	35.0	37.8	6	6.5	6	7	99.0	129	141	153	5	9	12
4 FT	10	11	9	7	7.5	6	6	72.6	34.0	37.0	40.0	7	7.5	6	6	77.5	127	139	151	5	8.5	0
6 FT	10	11	10	6	6	6	6	61.4	34.0	37.0	40.0	7	7.5	6	6	63.1	127	139	151	5	9	0
8 FT	10	12	10	7	7.5	7	6	59.8	34.3	37.3	40.3	7	7	6	6.5	59.8	128	140	152	5	9	0
10 FT	11	13	10	7	7	6	6	54.8	36.1	39.3	42.4	7	6.5	6	6.5	56.5	129	141	153	5	8.5	0
12 FT	12	14	10	7	6.5	6	6	51.5	33.9	36.8	39.6	7	6.5	6	6	53.1	130	142	154	5	8	0
14 FT	12	14	10	7	6.5	6	6	48.1	33.9	36.8	39.6	7	6	6	6	48.1	130	142	154	5	9.5	0
16 FT	13	15	10	7	6	7	7	51.5	34.4	37.3	40.1	7	6	6	6	48.1	131	143	155	5	8	0
18 FT	14	16	11	7	6	7	7.5	51.8	39.1	42.4	45.6	8	7.5	6	6.5	48.4	132	144	156	5	8.5	0
20 FT	15	18	11	8	7.5	7	7	58.5	37.0	40.0	43.0	8	7.5	6	7	46.8	134	146	158	5	7.5	0
22 FT	17	19	12	8	7.5	6	6	53.8	39.3	42.4	45.5	8	7.5	6	7	48.8	135	147	159	5	7.5	0
24 FT	18	20	12	8	7	7	7.5	58.8	39.8	42.9	46.0	8	7	6	6.5	48.8	136	148	160	5	7	0
26 FT	19	21	13	8	7	7	8	59.1	40.3	43.4	46.5	8	7	6	7	49.0	137	149	161	5	7	0
28 FT	20	22	13	8	7	7	7.5	59.1	42.4	45.6	48.9	8	7	6	6.5	49.0	138	150	162	5	6.5	0
30 FT	21	23	14	8	7	7	8	59.5	46.1	49.6	53.1	8	7	6	7	49.3	139	151	163	5	7	0
32 FT	22	24	14	8	6.5	7	7.5	59.5	46.8	50.1	53.6	8	6.5	6	6.5	49.3	140	152	164	5	6	0
34 FT	23	25	14	8	6.5	7	7	59.5	44.0	47.3	50.5	8	6.5	6	6.5	49.3	141	153	165	5	6	0
36 FT	24	26	15	8	6.5	7	7.5	59.9	49.5	53.1	56.8	8	6.5	6	6.5	49.6	142	154	166	5	6	0
38 FT	25	27	15	8	6	7	7.5	59.9	50.1	53.8	57.3	8	6.5	6	6.5	49.6	143	155	167	6	8	0
40 FT	26	28	15	8	6	7	7	59.9	50.8	54.3	57.9	8	6.5	6	6.5	49.6	144	156	168	6	8	0
42 FT	27	29	16	8	6	7	7.5	60.3	51.3	54.9	58.5	8	6	6	6.5	49.9	145	157	169	6	8	0
44 FT	28	30	16	8	6	7	7.5	60.3	53.6	57.4	61.1	8	6	6	6.5	49.9	146	158	170	6	8	0
46 FT	28	30	16	9	7	7	6.5	60.3	53.6	57.4	61.1	8	6	6	6	49.9	146	158	170	6	8	0
48 FT	29	31	17	9	7	7	7.5	60.5	54.3	58.0	61.8	8	6	6	6.5	50.1	147	159	171	6	7.5	0
50 FT	30	32	17	9	7	7	7.5	60.5	54.9	58.6	62.3	8	6	6	6.5	50.1	148	160	172	6	7.5	0
																						_
				SPAI	۷ (S) =	13 F	T		HE I	GHT (HT)	= 15	5 F T	OR	16 F	Γ			7		
	М	EMBE	R			T (OP SL	AB BAR	ŝ				вотто	M SL	AB BAF	RS		WALL	BARS	1		
DESIGN	TH.	CKN	ESS	A1	BARS			J3 BA	RS		A2 BA	RS			J4 BAF	RS		B2	BARS	1		
FILL	тс	DС	TV	C 1 7E	CDA	C 1 7E	CDA	C1	K	2	C 1 7E C	D	17E C	DA	C4	K	3	C 1 7E C	DA C1	П		

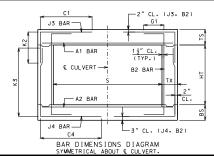
HEIGHT (HT) = 10 FT OR 11 FT OR 12 FT

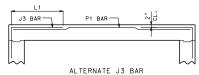
BOTTOM SLAB BARS

WALL BARS

											GHT	(HT) =	13 F	T OR	14 F	Т			\neg
		EMBE				T(P SLA	AB BARS	5				BOT	TOM SI	LAB BA	₹S		₩AL	L BAF	₹S
DESIGN	TH	CKNE	SS	A1	BARS			J3 BA			Α2	BARS			J4 BA			Ba	BAR:	3
FILL	TS	BS	ТX	SIZE	SPA.	SIZE	SPA.	C1	K HT=13'		SIZE	SPA.	SIZE	SPA.	C4	HT=131		SIZE	SPA.	G1
1 FT	12	12	9	6	6	6	6.5	99.0	36.8	39.3	6	6.5	6	6	99.0	164	176	5	8.5	12
2 FT	12	12	9	7	8	6	6.5	99.0	36.8	39.3	6	6	6	6	99.0	164	176	5	8	12
4 FT	10	12	10	6	6	6	6	99.6	34.6	37.0	7	8	6	6	99.6	164	176	5	8	0
6 FT	11	13	10	6	6	6	6.5	84.6	35.0	37.4	6	6	6	6.5	99.6	165	177	5	7.5	0
8 FT	11	13	10	6	6	7	6.5	74.8	35.0	37.4	7	7	6	6	84.6	165	177	5	7	0
10 FT	11	13	11	7	7.5	7	6.5	68.5	35.0	37.4	7	6.5	6	6	70.1	165	177	5	7.5	0
12 FT	12	14	12	7	7	6	6.5	62.1	37.1	39.8	7	6.5	6	6.5	67.3	166	178	5	7	0
14 FT	13	15	12	7	7	6	6	62.1	37.6	40.1	7	6	6	6	65.5	167	179	5	7	0
16 FT	13	15	12	7	6.5	7	7	60.5	37.6	40.1	7	6	6	6.5	58.8	167	179	5	7	0
18 FT	14	17	13	7	6.5	7	8	59.1	38.3	40.8	7	6	6	6.5	59.1	169	181	5	6.5	0
20 FT	15	18	13	7	6	7	7	67.6	40.5	43.1	7	6	6	6	59.1	170	182	5	6.5	0
22 FT	17	19	14	7	6	7	7.5	68.0	41.1	43.8	7	6	6	6	59.5	171	183	5	6	0
24 FT	18	20	14	7	6	7	7.5	66.3	43.5	46.3	8	7.5	6	6	59.5	172	184	5	6	0
26 FT	19	21	15	8	7.5	7	7.5	66.8	43.9	46.8	8	7	6	6	58.1	173	185	6	8	0
28 FT	20	22	15	8	7	7	7	66.8	44.4	47.1	8	7	6	6	58.1	174	186	6	8	0
30 FT	21	23	16	8	7	7	7	67.1	46.8	49.6	8	7	6	6	58.5	175	187	6	8	0
32 FT	22	24	16	8	7	7	7	67.1	49.3	52.3	8	7	7	7.5	61.9	176	188	6	8	0
34 FT	23	25	17	8	6.5	7	7	67.5	47.8	50.6	8	6.5	6	6	58.9	177	189	6	7.5	0
36 FT	24	26	17	8	6.5	7	6.5	67.5	52.3	55.4	8	6.5	7	7.5	62.3	178	190	6	7.5	0
38 FT	25	27	18	8	6.5	7	7	67.9	50.8	53.8	8	6.5	6	6	59.1	179	191	6	7	0
40 FT	25	28	18	8	6	7	6	67.9	51.0	54.0	8	6.5	6	6	59.1	180	192	6	7	0
42 FT	26	29	19	8	6	7	6.5	68.3	51.5	54.5	8	6.5	6	6	59.5	181	193	6	6.5	0
44 FT	27	30	19	8	6	7	6	68.3	52.0	55.0	8	6	6	6	59.5	182	194	6	6.5	0
46 FT	28	31	20	8	6	7	6.5	68.6	52.5	55.5	8	6	6	6	59.9	183	195	6	6.5	0
48 FT	29	31	20	8	6	7	6	68.6	57.0	60.3	8	6	7	7.5	63.4	183	195	6	6.5	0
50 FT	30	32	21	9	7.5	7	7	69.0	55.4	58.5	8	6	6	6	60.1	184	196	6	6	0

				SPAN (S) = 13 FT HEIGHT (HT) = 15 FT OR 16 FT							T			\neg						
		EMBE		TOP SLAB BARS BOTTOM SLAB BAR								₩AI	L BAI	₹Տ						
DESIGN	TH:	CKNE	ESS	A1	BARS			J3 B4	RS		A2	BARS			J4 BAI	RS		В:	2 BAR	S
FILL	TS	BS	тх	SIZE	SPA.	SIZE	SPA.	C1	K HT=15'		SIZE	SPA.	SIZE	SPA.	C4	K HT=151		SIZE	SPA.	G1
1 FT	13	13	11	6	6.5	5	6	98.5	34.1	36.3	6	6.5	6	7	100.3	189	201	5	7	12
2 FT	13	13	11	6	6.5	6	7.5	100.3	36.1	38.4	6	6.5	6	6.5	100.3	189	201	5	7	12
4 FT	10	13	11	6	6	6	6	100.3	35.6	37.8	6	6	6	6	100.3	189	201	5	6	0
6 FT	10	13	12	6	6.5	6	6	100.8	35.6	37.8	6	6	6	6	100.8	189	201	5	6	0
8 FT	11	13	12	6	6	6	6	94.1	35.9	38.0	7	7.5	6	6	100.8	189	201	6	8	0
10 FT	12	14	13	6	6	6	6.5	81.1	36.1	38.4	7	7	6	6	103.1	190	202	6	8.5	0
12 FT	13	15	14	6	6	6	6.5	74.8	38.6	40.9	7	7	6	6	85.0	191	203	5	6	0
14 FT	14	16	14	7	7.5	6	6	74.8	39.0	41.3	7	6.5	6	6	85.0	192	204	6	8	0
16 FT	14	16	14	7	7	6	6	68.0	39.0	41.3	7	6.5	6	6	73.1	192	204	5	6	0
18 FT	15	17	14	7	6.5	7	7.5	78.3	43.5	46.0	7	6	7	7	76.5	193	205	6	8	0
20 FT	16	18	15	7	6.5	7	7.5	78.6	43.9	46.4	7	6	7	8	75.3	194	206	6	8	0
22 FT	17	19	16	7	6.5	7	7.5	77.4	46.4	49.0	7	6	7	8	74.0	195	207	6	8	0
24 FT	18	20	16	7	6	7	7	77.4	46.9	49.5	8	7.5	7	7	74.0	196	208	6	8	0
26 FT	19	21	17	7	6	7	7	77.9	49.5	52.3	8	7.5	7	7	74.4	197	209	6	7.5	0
28 FT	20	23	18	7	6	7	7	78.3	48.0	50.6	8	7.5	7	7	74.9	199	211	6	7	0
30 FT	21	23	18	8	7.5	7	7	78.3	52.5	55.5	8	7	7	6.5	74.9	199	211	6	7	0
32 FT	22	24	19	8	7	7	7	78.8	53.0	55.9	8	7	7	6.5	73.5	200	212	6	6.5	0
34 FT	23	25	19	8	7	7	6	78.8	53.5	56.4	8	6.5	7	6	73.5	201	213	6	6.5	0
36 FT	24	26	20	8	7	7	6.5	79.3	54.0	56.9	8	6.5	7	6.5	73.9	202	214	6	6.5	0
38 FT	25	27	21	8	6.5	7	6.5	79.6	56.8	59.8	8	6.5	7	7	74.4	203	215	6	6	0
40 FT	25	28	22	8	6.5	7	6	78.4	57.0	60.0	8	6.5	7	7	74.8	204	216	6	6	0
42 FT	26	29	22	8	6.5	7	6	80.1	57.5	60.5	8	6.5	7	7	74.8	205	217	6	6	0
44 FT	27	30	23	8	6.5	7	6	80.5	58.0	61.0	8	6.5	7	7	75.1	206	218	7	7.5	0
46 FT	28	31	24	8	6	7	6.5	81.0	58.5	61.5	8	6	7	7	75.6	207	219	7	7.5	0
48 FT	29	31	24	8	6	7	6	81.0	61.1	64.3	8	6	7	6.5	75.6	207	219	7	7.5	0
50 FT	29	32	25	8	6	7	6	79.6	59.0	62.0	8	6	7	6.5	76.0	208	220	7	7	0





ALTERNATE J3 BAR
AT CONTRACTOR'S OPTION. ALTERNATE J3 BARS MAY BE
USED WHEN THE DISTANCE BETWEEN THE ENDS OF J3 BARS
IN THE TOP SLAB IS LESS THAN 2-0-0" DIMENSION L1
WHERE L1 STALLED USED WITH ALTERNATE J3 BARS WITH
WHERE L1 STALLED USED WITH ALTERNATE J3 BARS WITH
AND 76 BARS. RESPECTIVELY. ADDITIONAL PI BARS ARE
EQUITED WITH ALTERNATE J3 BARS WITH A LENGTH
EQUAL TO A1 BARS. AND SIZE AND SPEINE NO EDUAL TO J3
BARS. NO ADDITIONAL PAYMENT WILL BE MADE FOR THIS
SUBSTITUTION.

GENERAL NOTES:

SPAN (S) = 13 FT

MEMBER

TOP SLAB BARS

GENERAL NOTES:

IF DESIGN FILL IS BETWEEN TABULATED DESIGN FILLS, USE HEE NEXT ORGATER TABULATED DESIGN FILLT EXCEPT OF THE NEXT ORGATER THE NEXT ORGATER THE NEXT ORGATER NEXT OF THE NEX

SPECIAL DESIGNS ARE REQUIRED WHEN THE DESIGN FILL IS LESS THAN 1 FOOT OR GREATER THAN 50 FEET.

DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.

DESIGN FILLS ARE MEASURED FROM THE TOP OF TOP SLAB TO THE TOP OF EARTH FILL OR ROADWAY.

CULVERTS MEET STRENGTH AND SERVICEABILITY REQUIREMENTS FOR THE DESIGN VEHICULAR LIVE LOAD HL-93 MINUS THE LANE LOAD.



MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)



CONCRETE SINGLE BOX CULVERT

MEMBER THICKNESS BAR SIZE. SPACING & DIMENSIONS

SPAN (S): 13 FEET HEIGHT (HT): 7 THRU 16 FEET

DATE EFFECTIVE: DATE PREPARED:

4/18/2011

703.17

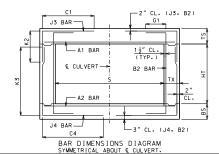
SHEET NO. 11 OF 14

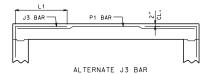
					SP	AN (S)	= 14	FT		HE	IGHT	(HT) =	7 F	T OR	8 FT	OR '	9 FT				\neg
	П		EMBE					TOP	SLAB E	BARS						вотток	SLAB	BARS			₩AI	L BAF	RS
DEST	GN	THI	CKNE	ESS	A1	BARS			J3	BARS			A2	BARS			J4	BARS			B	2 BARS	5
FIL	Ĺ	TS	BS	ТХ	SIZE	SPA.	SIZE	SPA.	C1	HT=7'	K2 HT=8'	HT=9'	SIZE	SPA.	SIZE	SPA.	C4	HT=7'	K3 HT=8'	HT=9'	SIZE	SPA.	G1
1 F	T	13	12	8	6	6	5	7	102.1	33.3	37.1	41.0	6	6.5	6	6.5	66.9	92	104	116	5	12	12
2 F	T	13	12	8	7	8	5	6	102.1	33.3	37.1	41.0	6	6	6	6	58.1	92	104	116	5	12	12
4 F	T	10	11	8	7	6.5	7	6	52.8	34.0	38.1	42.1	7	7	6	6	49.3	91	103	115	5	12	0
6 F	T	11	12	8	7	7	6	6	45.8	31.6	35.4	39.0	7	7	6	7	44.0	92	104	116	5	12	0
8 F		11	12	8	7	6.5	7	6.5	45.8	35.8	39.9	44.1	7	6	6	6	42.3	92	104	116	5	12	0
10 F	Т	12	13	8	7	6	7	6.5	44.0	33.3	37.1	41.0	8	7.5	6	6.5	38.8	93	105	117	5	12	0
12 F	Т	12	14	8	8	7	7	6	42.3	36.8	41.0	45.1	8	7	6	7	37.0	94	106	118	5	12	0
14 F		13	16	8	8	6.5	7	6	42.3	33.5	37.3	40.9	8	7	5	6	31.6	96	108	120	5	12	0
16 F	T	13	16	8	8	6.5	7	6	40.5	33.5	37.3	40.9	8	7	5	6	31.6	96	108	120	5	12	0
18 F		15	17	8	8	6.5	7	7	45.8	35.5	39.4	43.3	8	6.5	6	7.5	35.3	97	109	121	5	12	0
20 F	T	16	19	8	8	6	7	6.5	45.8	36.5	40.4	44.1	8	7	5	6	31.6	99	111	123	5	11.5	0
22 F		18	20	8	8	6	7	7.5	45.8	38.6	42.6	46.5	8	6.5	6	7.5	35.3	100	112	124	5	9.5	0
24 F		19	21	8	8	6	7	7	45.8	44.0	48.5	52.9	8	6.5	6	7.5	35.3	101	113	125	5	9.5	0
26 F		21	23	9	8	6	6	6.5	42.5	41.9	45.9	50.0	8	6.5	5	6	33.6	103	115	127	5	8.5	0
28 F		22	24	9	8	6	6	6	42.5	46.3	50.8	55.1	8	6.5	6	7	35.4	104	116	128	5	8.5	0
30 F		23	25	10	8	6	6	6.5	42.8	43.1	47.3	51.4	8	6.5	5	6	33.9	105	117	129	5	8.5	0
32 F		24	26	10	9	7.5	6	6	42.8	45.1	49.4	53.5	8	6	5	6	33.9	106	118	130	5	8	0
34 F		25	27	11	9	7	6	7	43.0	45.9	50.0	54.3	8	6	5	6	34.0	107	119	131	5	8.5	0
36 F		26	28	11	9	7	6	7	43.0	46.5	50.8	55.0	8	6	5	6	34.0	108	120	132	5	7.5	0
50 1		27	29	11	9	7	6	7	43.0	51.3	55.9	60.4	8	6	6	7.5	37.6	109	121	133	5	7.5	0
40 F		28	30	11	9	7	6	6.5	43.0	52.0	56.6	61.1	8	6	6	7	37.6	110	122	134	5	7.5	0
42 F		29	31	12	9	6.5	6	7	43.3	54.3	58.9	63.6	9	7.5	6	7.5	37.8	111	123	135	5	7	0
44 F		30	32	12	9	6.5	6	1	43.3	55.0	59.6	64.4	9	7	6	7.5	37.8	112	124	136	5	7	0
46 F		31	33	12	9	6.5	6	7	43.3	55.8	60.5	65.1	9	7	6	7	37.8	113	125	137	5	7	0
48 F		32	33	12	9	6.5	6	7	43.3	56.1	60.9	65.5	9	7	6	7	37.8	113	125	137	5	7	0
50 F	T	33	34	12	9	6.5	6	7	43.3	58.4	63.3	68.0	9	7	6	7	37.8	114	126	138	5	6.5	0

				SPAN (S) = 14 FT HE								(TH)	= 1	0 F	T OR	11 F	T OR	12 F	T			\neg
		EMBE					TOP	SLAB E	BARS					6	зотто	/ SLAB	BARS			₩AI		
DESIGN	TH	CKNE	SS	A1	BARS			J3	BARS			A2	BARS			J4	BARS			B	2 BARS	S
FILL	TS	BS	ТX	SIZE	SPA.	SIZE	SPA.	C1	HT=10'	K2 HT=11'	HT=12'	SIZE	SPA.	SIZE	SPA.	C4	HT=10'	K3 ht=11	HT=12	SIZE	SPA.	G1
1 FT	13	12	9	6	6	5	6.5	102.6	33.6	36.5	39.4	6	6	6	6	106.3	128	140	152	5	9	12
2 FT	13	12	9	7	7.5	5	6	102.6	33.6	36.5	39.4	7	7.5	6	6	106.3	128	140	152	5	8.5	12
4 FT	11	12	9	7	7	6	6.5	69.0	35.9	39.0	42.1	7	7.5	6	6	72.6	128	140	152	5	9	0
6 FT	11	12	9	7	7	6	6	60.1	35.9	39.0	42.1	7	6.5	6	6	62.0	128	140	152	5	9	0
8 FT	11	12	10	7	7	6	6	55.1	35.9	39.0	42.1	7	6.5	6	6	57.0	128	140	152	5	10	0
10 FT	12	13	10	7	6.5	6	6	53.4	36.4	39.5	42.6	7	6	6	6	53.4	129	141	153	5	9.5	0
12 FT	12	14	10	8	7.5	7	6	55.1	36.6	39.8	42.9	8	7	6	6	51.6	130	142	154	5	9	0
14 FT	14	16	10	8	7.5	7	7	53.4	39.1	42.4	45.6	8	7.5	6	6	49.9	132	144	156	5	8	0
16 FT	14	16	10	8	7	7	7	49.9	39.1	42.4	45.6	8	7	6	6.5	46.3	132	144	156	5	9	0
18 FT	15	17	11	8	7	7	7.5	59.1	39.8	42.9	46.1	8	7	6	6	46.5	133	145	157	5	9.5	0
20 FT	16	19	11	8	6.5	7	6.5	57.3	37.5	40.5	43.5	8	7	6	7	46.5	135	147	159	5	8	0
22 FT	18	20	12	8	7	7	7.5	57.6	39.8	42.9	46.0	8	7	6	6.5	46.8	136	148	160	5	8	0
24 FT	19	21	12	8	6.5	7	7	57.6	43.4	46.8	50.1	8	6.5	6	6.5	46.8	137	149	161	5	7.5	0
26 FT	20	23	13	8	6.5	7	7	57.9	41.1	44.3	47.4	8	6.5	6	7	47.0	139	151	163	5	7.5	0
28 FT	21	24	13	8	6	7	6.5	57.9	43.3	46.5	49.6	8	6.5	6	7	47.0	140	152	164	5	7	0
30 FT	22	25	14	8	6	7	6.5	58.3	43.8	47.0	50.3	8	6.5	6	7	47.4	141	153	165	5	7	0
32 FT	24	26	14	8	6	7	7.5	58.3	46.3	49.5	52.9	8	6	6	6.5	47.4	142	154	166	5	6.5	0
34 FT	25	27	14	8	6	7	7.5	58.3	46.8	50.1	53.5	8	6	6	6.5	47.4	143	155	167	5	6	0
36 FT	26	28	14	9	7.5	7	6.5	58.3	47.4	50.6	54.0	8	6	6	6.5	47.4	144	156	168	5	6	0
38 FT	27	29	15	9	7	7	7.5	58.5	51.3	54.9	58.5	8	6	6	6.5	47.6	145	157	169	6	8	0
40 FT	28	30	15	9	7	7	7.5	58.5	53.6	57.4	61.1	8	6	6	6.5	47.6	146	158	170	6	8	0
42 FT	29	31	15	9	7	7	6.5	58.5	54.3	58.0	61.8	9	7.5	6	6.5	47.6	147	159	171	6	8	0
44 FT	30	32	16	9	7	7	7.5	58.9	54.9	58.6	62.3	9	7	6	6.5	49.6	148	160	172	6	8	0
46 FT	31	33	16	9	6.5	7	7.5	58.9	55.5	59.3	62.9	9	7	6	6.5	49.6	149	161	173	6	8	0
48 FT	31	33	16	9	6.5	7	6.5	58.9	55.5	59.3	62.9	9	7	6	6	49.6	149	161	173	6	8	0
50 FT	32	34	17	9	6.5	7	7	59.3	56.1	59.9	63.5	9	7	6	6.5	50.0	150	162	174	6	7.5	0

				SPAN (S) = 14 FT HEIGHT (HT) = 13 FT OR 14 FT																
		EMBE				T(OP SL	AB BARS					BOT	TOM SI	LAB BAF			₩AL		
DESIGN	TH.	CKNE	SS	A1	BARS			J3 BA			A2	BARS			J4 BAF			Ba	BAR	3
FILL	TS	BS	ТX	SIZE	SPA.	SIZE	SPA.	C1	K HT=13'		SIZE	SPA.	SIZE	SPA.	C4	HT=13'	.3 HT=14	SIZE	SPA.	G1
1 FT	12	12	10	6	6	6	7	105.0	36.8	39.3	6	6	6	6	105.0	164	176	5	8	12
2 FT	13	13	10	7	8	6	7	105.0	35.4	37.8	7	8	6	6.5	105.0	165	177	5	8	12
4 FT	11	12	10	7	7.5	6	6.5	105.0	36.5	39.0	7	7	6	6	105.0	164	176	5	8	0
6 FT	11	13	10	7	7.5	6	6	76.5	35.0	37.4	7	7	6	6	87.3	165	177	5	8	0
8 FT	11	13	11	7	7.5	6	6	66.3	35.0	37.4	7	6.5	6	6	71.6	165	177	5	7.5	0
10 FT	12	14	11	7	7	6	6	64.5	37.1	39.8	7	6	6	6	68.0	166	178	5	7.5	0
12 FT	13	15	12	7	6.5	6	6	61.3	37.6	40.1	7	6	6	6.5	64.8	167	179	5	7	0
14 FT	14	16	13	7	6.5	6	6	59.8	38.0	40.5	7	6	6	6.5	63.4	168	180	5	6.5	0
16 FT	14	16	13	7	6	7	8	59.8	38.0	40.5	8	7.5	6	6	56.1	168	180	5	7.5	0
18 FT	15	18	13	7	6	7	7	67.0	40.5	43.1	8	7.5	6	6.5	56.1	170	182	5	6.5	0
20 FT	16	19	13	8	7	7	6.5	65.1	40.9	43.5	8	7	6	6	56.1	171	183	5	6.5	0
22 FT	18	20	14	8	7	7	7	65.5	43.5	46.3	8	7	6	6	56.4	172	184	5	6	0
24 FT	19	22	14	8	7	7	7	65.5	44.1	46.9	8	7	6	6	56.4	174	186	5	6	0
26 FT	20	23	15	8	6.5	7	7	65.9	44.6	47.4	8	6.5	6	6	56.8	175	187	6	8	0
28 FT	21	24	15	8	6.5	7	6.5	65.9	45.1	47.9	8	6.5	6	6	56.8	176	188	6	8	0
30 FT	22	25	16	8	6.5	7	6.5	66.3	47.5	50.4	8	6.5	6	6	57.0	177	189	6	8	0
32 FT	23	26	16	8	6	7	6	66.3	50.0	53.0	8	6	7	8	58.9	178	190	6	8	0
34 FT	24	27	17	8	6	7	6	66.6	48.5	51.4	8	6	6	- 6	57.4	179	191	6	7.5	0
36 FT	25	28	17	8	6	7	6	66.6	53.0	56.1	8	6	7	8	59.3	180	192	6	7.5	0
38 FT	26	29	18	9	7.5	7	6	67.0	51.5	54.5	8	6	6	6	57.6	181	193	6	7	0
40 FT	27	30	18	9	7	7	6	67.0	54.1	57.3	8	6	7	8	61.4	182	194	6	7	0
42 FT	28	31	19	9	7	7	6	67.4	52.5	55.5	9	7.5	6	6	58.0	183	195	6	6.5	0
44 FT	29	32	19	9	7	7	6	67.4	57.3	60.5	9	7	7	8	61.8	184	196	6	6.5	0
46 FT	30	33	20	9	7	7	6.5	67.6	55.6	58.8	9	7	6	6	58.3	185	197	6	6.5	0
48 FT	31	34	20	9	6.5	17	6	67.6	58.4	61.5	9	7	7	8	62.0	186	198	6	6.5	0
50 FT	32	35	21	9	6.5	<u> 7</u>	6.5	69.9	56.6	59.8	9	7	6	6	58.6	187	199	6	6	0

				SPAN (S) = 14 FT																
		EMBE			TOP SLAB BARS A1 BARS J3 BARS							BOT	TOM SI	LAB BAF	₹S			L BAF		
DESIGN	TH	ICKN	ESS	A1	BARS			J3 BA			A2	BARS			J4 BAF			В:	2 BARS	3
FILL	TS	BS	тх	SIZE	SPA.	SIZE	SPA.	C1	K HT=15'		SIZE	SPA.	SIZE	SPA.	C4	K HT=15	3 HT=16	SIZE	SPA.	G1
1 FT	12	13	11	6	6	6	6	105.6	36.0	38.1	6	6	6	6.5	105.6	189	201	5	7	12
2 FT	13	14	11	6	6	6	7	105.6	38.4	40.6	6	6	6	6.5	105.6	190	202	5	7	12
4 FT	11	13	11	7	7.5	6	6	105.6	35.9	38.0	7	7.5	6	6	105.6	189	201	5	6	0
6 FT	11	13	12	6	6	6	6.5	99.0	35.9	38.0	7	7	6	6	108.0	189	201	5	6	0
8 FT	12	14	12	7	8	6	6.5	86.4	36.1	38.4	7	7	6	6	108.0	190	202	5	6	0
10 FT	12	15	13	7	7.5	6	6	74.3	36.4	38.5	7	6.5	6	6.5	90.5	191	203	5	6	0
12 FT	13	16	14	7	7	6	6	71.0	38.8	41.0	7	6.5	6	6.5	81.9	192	204	5	6	0
14 FT	14	17	14	7	6.5	7	7.5	72.8	39.1	41.4	7	6	6	6	78.3	193	205	5	6	0
16 FT	14	17	14	7	6.5	7	7.5	67.4	39.1	41.4	7	6	6	6	69.1	193	205	5	6	0
18 FT	15	18	14	7	6	7	7	76.5	43.6	46.3	8	7	7	7	72.8	194	206	5	6	0
20 FT	16	19	15	8	7.5	7	6.5	75.0	44.1	46.6	8	7	7	7.5	71.4	195	207	6	8	0
22 FT	18	20	16	8	7.5	7	7	75.5	49.0	51.8	8	7	7	7	71.8	196	208	6	8	0
24 FT	19	22	16	8	7	7	6.5	75.5	47.5	50.1	8	7	7	7	71.8	198	210	6	8	0
26 FT	20	23	17	8	7	7	6.5	75.9	48.0	50.6	8	6.5	7	7	72.1	199	211	6	7.5	0
28 FT	21	24	18	8	7	7	6.5	76.3	48.4	51.0	8	6.5	7	7	70.6	200	212	6	7	0
30 FT	22	25	18	8	6.5	7	6	76.3	51.0	53.9	8	6.5	7	6.5	70.6	201	213	6	7	0
32 FT	23	26	19	8	6.5	7	6	76.6	51.5	54.3	8	6.5	7	7	71.0	202	214	6	6.5	0
34 FT	24	27	20	8	6.5	7	6	77.1	52.0	54.8	8	6	7	7	71.5	203	215	6	6.5	0
36 FT	25	28	20	8	6	7	6	77.1	52.5	55.3	8	6	7	6.5	71.5	204	216	6	6.5	0
38 FT	26	29	21	8	6	7	6	77.5	55.3	58.1	8	6	7	7	71.9	205	217	6	6	0
40 FT	27	30	22	8	6	7	6	77.9	58.0	61.0	8	6	7	7	72.3	206	218	6	6	0
42 FT	28	31	23	8	6	7	6.5	78.3	58.5	61.5	8	6	7	7.5	72.6	207	219	7	8	0
44 FT	29	32	23	9	7.5	7	6	78.3	59.0	62.0	9	7.5	7	7	72.6	208	220	7	7.5	0
46 FT	30	33	24	9	7	7	6	78.8	61.9	65.0	9	7	7	7	73.0	209	221	7	7.5	0
48 FT	31	34	25	9	7	7	6.5	79.1	62.4	65.5	9	7	7	7	73.4	210	222	7	7.5	0
50 FT	32	35	25	9	7	7	6	79.1	62.9	66.0	9	7	7	7	73.4	211	223	7	7	0





ALTERNATE J3 BAR
AT CONTRACTOR'S OPTION. ALTERNATE J3 BARS MAY BE
USED WHEN THE DISTANCE BETWEEN THE ENDS OF J3 BARS
IN THE TOP SLAB IS LESS THAN 2-0-0" DIMENSION L1
WHERE L1 STALLED USED WITH ALTERNATE J3 BARS WITH
WHERE L1 STALLED USED WITH ALTERNATE J3 BARS WITH
AND 76 BARS. RESPECTIVELY. ADDITIONAL PI BARS ARE
EQUITED WITH ALTERNATE J3 BARS WITH A LENGTH
EQUAL TO A1 BARS. AND SIZE AND SPEINE NO EDUAL TO J3
BARS. NO ADDITIONAL PAYMENT WILL BE MADE FOR THIS
SUBSTITUTION.

GENERAL NOTES:

GENERAL NOTES:

IF DESIGN FILL IS BETWEEN TABULATED DESIGN FILLS, USE HEE NEXT ORGATER TABULATED DESIGN FILLT EXCEPT OF THE NEXT ORGATER THE NEXT ORGATER THE NEXT ORGATER NEXT OF THE NEX

SPECIAL DESIGNS ARE REQUIRED WHEN THE DESIGN FILL IS LESS THAN 1 FOOT OR GREATER THAN 50 FEET.

DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.

DESIGN FILLS ARE MEASURED FROM THE TOP OF TOP SLAB TO THE TOP OF EARTH FILL OR ROADWAY.

CULVERTS MEET STRENGTH AND SERVICEABILITY REQUIREMENTS FOR THE DESIGN VEHICULAR LIVE LOAD HL-93 MINUS THE LANE LOAD.



MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)



CONCRETE SINGLE BOX CULVERT

MEMBER THICKNESS BAR SIZE, SPACING & DIMENSIONS

SPAN (S): 14 FEET HEIGHT (HT): 7 THRU 16 FEET

DATE EFFECTIVE: DATE PREPARED: 04/01/2011 4/18/2011

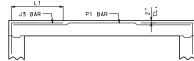
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17 12 OF 14

				SF	AN (S)	= 15	FT		H(EIGHT	(H)) =	8 F	T OR	9 FT	OR	10 FT				
		EMBE					TOP	SLAB E	BARS						BOTTON	SLAB	BARS			WAL	LL BAF	₹S
DESIGN	TH	CKNE	SS	A1	BARS			J3	BARS			A2	BARS			J4	BARS			Ba	2 BARS	ŝ
FILL	TS	BS	ТX	SIZE	SPA.	SIZE	SPA.	C1	HT=8'	K2 HT=9'	HT=10'	SIZE	SPA.	SIZE	SPA.	C4	HT=8'	K3 HT=9'	HT=10'	SIZE	SPA.	G1
1 FT	12	13	8	7	7	6	7	109.0	32.5	35.9	39.3	6	6	6	7	82.8	105	117	129	5	12	12
2 FT	12	13	8	7	6.5	6	6.5	109.0	33.6	37.1	40.6	7	7.5	6	6.5	65.8	105	117	129	5	12	12
4 FT	11	12	8	7	6	6	6	52.6	35.4	39.0	42.8	7	7	6	6	52.6	104	116	128	5	12	0
6 FT	11	12	9	7	6.5	6	6	51.0	35.4	39.0	42.8	7	6.5	6	6	49.1	104	116	128	5	12	0
8 FT	11	12	9	7	6	7	6	51.0	35.4	39.0	42.8	8	7.5	6	6	47.3	104	116	128	5	12	0
10 FT	12	14	9	8	7.5	7	6	49.1	32.8	36.1	39.5	8	7	6	7	43.5	106	118	130	5	12	0
12 FT	13	15	9	8	6.5	7	6.5	47.3	34.5	38.0	41.5	8	6.5	6	7	41.6	107	119	131	5	12	0
14 FT	14	17	9	8	6.5	7	6.5	45.4	34.1	37.5	40.9	8	6.5	6	8	39.8	109	121	133	5	12	0
16 FT	14	17	9	8	6	7	6	43.5	34.1	37.5	40.9	8	6.5	6	8	37.8	109	121	133	5	12	0
18 FT	16	19	9	8	6	7	7	49.1	36.5	40.0	43.5	8	6.5	6	8	37.8	111	123	135	5	12	0
20 FT	17	20	9	9	7.5	7	6	49.1	37.1	40.6	44.1	8	6.5	6	7.5	37.8	112	124	136	5	11	0
22 FT	19	21	9	9	7.5	7	7	49.1	43.3	47.3	51.1	8	6	6	7	37.8	113	125	137	5	9	0
24 FT	21	23	10	8	6	6	6	43.8	41.9	45.6	49.3	8	6	6	8	38.0	115	127	139	5	9	0
26 FT	22	24	11	9	7.5	6	6	43.9	42.5	46.3	49.9	8	6	6	8	38.3	116	128	140	5	10.5	0
28 FT	23	25	11	9	7	6	6	43.9	43.1	46.8	50.5	8	6	6	8	38.3	117	129	141	5	9	0
30 FT	24	26	11	9	7	7	7.5	49.6	49.4	53.5	57.8	9	7.5	6	7	38.3	118	130	142	5	8	0
32 FT	26	28	12	9	7	6	6.5	46.1	46.4	50.3	54.1	8	6	6	8.5	38.4	120	132	144	5	8	0
34 FT	27	29	12	9	7	6	6.5	46.1	51.5	55.6	59.9	9	7.5	6	8	38.4	121	133	145	5	7.5	0
36 FT	28	30	12	9	6.5	6	6.5	46.1	52.1	56.4	60.5	9	7	6	8	38.4	122	134	146	5	7	0
38 FT	29	31	12	9	6.5	6	6	46.1	54.4	58.6	63.0	9	7	6	7.5	38.4	123	135	147	5	7	0
40 FT	30	32	13	9	6.5	6	6.5	46.4	55.1	59.4	63.8	9	7	6	7.5	40.5	124	136	148	5	6.5	0
42 FT	31	33	13	9	6.5	6	6.5	46.4	55.8	60.1	64.5	9	7	6	7	40.5	125	137	149	5	6.5	0
44 FT	32	34	13	9	6	6	6.5	46.4	56.5	60.9	65.1	9	6.5	6	7	40.5	126	138	150	5	6.5	0
46 FT	33	35	13	9	6	6	6.5	46.4	57.3	61.5	65.9	9	6.5	6	6.5	40.5	127	139	151	5	6.5	0
48 FT	34	36	13	9	6	6	6.5	46.4	59.6	64.0	68.5	9	6.5	6	6.5	40.5	128	140	152	5	6.5	0
50 FT	35	36	13	9	6	6	6.5	46.4	60.0	64.4	68.9	9	6.5	6	6	40.5	128	140	152	5	6	0

48 F I	34	36	13	9	ь	6	6.5	46.4	59.6	64.0	68.5	9	6.5	ь	6.5	40.5	128	140	152	5	6.5	0
50 FT	35	36	13	9	6	6	6.5	46.4	60.0	64.4	68.9	9	6.5	6	6	40.5	128	140	152	5	6	0
				SPA	N (S	5) =	15	FT		HE I	GHT	(HT)	= 1	4 F	T OR	15 F	T OR	16 F	T			
	М	EMBE	R				TOP	SLAB E	BARS						вотто	/ SLAB	BARS			WAL	L BAF	₹S
DESIGN	TH	CKNE	SS	Α1	BARS			J3	BARS			Α2	BARS			J4	BARS			Ba	2 BARS	5
FILL	TS	BS	T.V.	SIZE	SPA.	C 1.7F	SPA.			K2		SIZE	SPA.	SIZE	SPA.	C4		К3		C 1 75	SPA.	G1
	15	B2	TX	SIZE	SPA.	SIZE	SPA.	C1	HT=14'	HT=15'	HT=16'	SIZE	SPA.	SIZE	SPA.	L4	HT=14'	HT=151	HT=16	SIZE	SPA.	161
1 FT	13	14	11	7	8	6	7.5	112.8	36.1	38.4	40.6	7	8	6	7	112.8	178	190	202	5	7.5	12
2 FT	13	14	11	7	7.5	6	6.5	112.8	38.0	40.4	42.8	7	7.5	6	6.5	112.8	178	190	202	5	7	12
4 FT	12	13	11	7	7	6	6.5	112.8	37.6	40.0	42.4	7	7	6	6	112.8	177	189	201	5	6.5	0
6 FT	12	13	12	7	7.5	6	6.5	92.1	37.6	40.0	42.4	7	6.5	6	6	97.9	177	189	201	5	6.5	0
8 FT	12	14	13	7	7.5	6	6	77.3	37.8	40.3	42.6	7	6.5	6	6	84.9	178	190	202	5	6.5	0
10 FT	13	15	13	7	6.5	6	6	73.4	38.3	40.6	43.0	7	6	6	6	81.0	179	191	203	5	6.5	0
12 FT	14	16	14	7	6.5	7	8	73.8	38.6	41.0	43.4	8	7.5	6	6	75.6	180	192	204	5	6	0
14 FT	15	17	14	7	- 6	7	7	81.5	41.0	43.5	46.0	8	7	7	7.5	75.6	181	193	205	5	6	0
16 FT	16	18	15	8	7.5	7	7	80.0	45.3	48.1	50.9	8	7	7	7	74.1	182	194	206	6	8	0
18 FT	16	19	15	8	7	7	7	74.1	41.6	44.1	46.6	8	7	7	7.5	70.3	183	195	207	6	8	0
20 FT	17	20	15	8	7	7	6	74.1	46.0	48.8	51.5	8	6.5	7	7	68.3	184	196	208	6	8	0
22 FT	19	21	15	8	6.5	7	6	74.1	50.8	53.8	56.8	8	6	7	6	68.3	185	197	209	6	8	0
24 FT	20	23	16	8	6.5	7	6	74.5	47.4	50.1	52.9	8	6	7	6.5	68.6	187	199	211	6	8	0
26 FT	21	24	17	8	6	7	6	72.9	49.9	52.8	55.6	8	6	7	7	69.0	188	200	212	6	7.5	0
28 FT	23	25	17	8	6	7	6	72.9	54.9	58.0	61.1	8	6	7	6	69.0	189	201	213	6	7.5	0
30 FT	24	27	18	8	6	7	6	73.3	51.4	54.3	57.1	8	6	7	6.5	69.3	191	203	215	6	7	0
32 FT	25	28	19	8	6	7	6	73.6	49.6	52.5	55.3	8	6	7	7	69.6	192	204	216	6	6.5	0
34 FT	26	29	20	8	6	7	6	74.0	52.4	55.3	58.1	9	7.5	7	7	68.0	193	205	217	6	6.5	0
36 FT	27	30	21	9	7.5	7	6	74.4	52.8	55.6	58.5	9	7	7	7.5	68.4	194	206	218	6	6.5	0
38 FT	28	31	21	9	7	7	6	74.4	55.5	58.5	61.5	9	7	7	7	68.4	195	207	219	6	6	0
40 FT	29	32	22	9	7	<u> </u>	6	74.8	60.5	63.8	67.0	9	7	7	7	68.6	196	208	220	6	6	0
42 FT	30	33	23	9	7	7	6	77.1	61.0	64.3	67.5	9	7	7	7	69.0	197	209	221	6	6	0
44 FT	31	34	24	9	6.5	7	6	77.5	61.5	64.8	68.0	9	6.5	7	7	69.4	198	210	222	6	6	0
46 FT	32	35	24	9	6.5	17	6	77.5	62.1	65.4	68.6	9	6.5	7	7	69.4	199	211	223	7	8	0
48 FT	33	36	25	9	6.5	1	6	77.9	65.0	68.4	71.6	9	6.5	7	7	69.8	200	212	224	7	8	0
50 FT	34	37	25	9	6.5	L 7	6	77.9	65.5	68.9	72.3	9	6.5	- 7	_ 7	71.8	201	213	225	7	7.5	0

	C1
2	
1	A1 BAR 1½" CL.
	CCULVERT→ B2 BAR→
50	 S TX -
	A2 BAR
·	
	J4 BAR 3" CL. (J4. B2)
	BAR DIMENSIONS DIAGRAM SYMMETRICAL ABOUT & CULVERT.



ALTERNATE J3 BAR

SPAN (S) = 15 FT																						
															T OR	12 F	T OR	13 F	T			
	M	EMBE	R				TOP	SLAB E	BARS						зотто	/ SLAB	BARS			WAL	L BAF	RS
DESIGN		CKNE		Δ1	BARS			.13	BARS			Α2	BARS				BARS			B2	BAR:	5
FILL										K2								К3				
	TS	BS	TX	SIZE	SPA.	S I ZE	SPA.	C1	HT=11'	HT=12'	HT=13'	SIZE	SPA.	SIZE	SPA.	C4	HT=11	HT=12	HT=13	SIZE	SPA.	G1
1 FT	12	12	9	7	7	6	6.5	109.6	36.3	39.1	42.0	7	7	6	6	109.6	140	152	164	5	8.5	12
2 FT	13	14	9	7	7	6	6.5	109.6	38.5	41.5	44.5	7	7.5	6	6	109.6	142	154	166	5	8.5	12
4 FT	11	12	10	7	6.5	6	6	74.1	36.0	38.9	41.8	7	7	6	6	76.0	140	152	164	5	8	0
6 FT	12	13	10	7	7	6	6.5	64.6	36.5	39.4	42.3	7	6.5	6	6.5	68.4	141	153	165	5	8	0
8 FT	12	13	10	7	6.5	6	6	58.9	36.5	39.4	42.3	7	6	6	6	62.8	141	153	165	5	8	0
10 FT	13	14	10	7	6	7	7	58.9	38.5	41.5	44.5	8	7	6	6	58.9	142	154	166	5	8	ō
12 FT	13	15	10	8	7	7	6	57.0	38.8	41.8	44.8	8	6.5	7	6.5	58.9	143	155	167	5	8	ō
14 FT	14	17	11	8	7	7	6.5	57.3	39.5	42.5	45.5	8	6.5	6	6	53.5	145	157	169	5	7.5	0
16 FT	14	17	11	8	6.5	7	6	53.5	39.5	42.5	45.5	8	6.5	6	6	49.6	145	157	169	5	8.5	0
18 FT	16	19	12	8	6.5	7	7	61.5	40.5	43.5	46.5	8	6.5	6	6.5	49.9	147	159	171	5	8.5	0
20 FT	17	20	12	8	6	7	6	61.5	41.0	44.0	47.0	8	6.5	6	6	49.9	148	160	172	5	7.5	0
22 FT	19	22	13	8	6.5	7	7	61.8	43.6	46.8	49.9	8	6.5	6	6.5	50.1	150	162	174	5	7.5	0
24 FT	20	23	13	8	6	7	6.5	59.9	44.3	47.4	50.5	8	6	6	6	50.1	151	163	175	5	6.5	0
26 FT	21	24	14	8	6	7	6	62.1	46.5	49.6	52.9	8	6	6	6.5	50.5	152	164	176	5	7	0
28 FT	23	25	14	8	6	7	7	60.1	47.3	50.5	53.8	8	6	6	6	50.5	153	165	177	5	6	0
30 FT	24	27	15	9	7.5	7	7	60.5	48.0	51.3	54.5	8	6	6	6.5	50.8	155	167	179	5	6	0
32 FT	25	28	15	9	7	7	6.5	60.5	50.4	53.8	57.1	8	6	6	6	50.8	156	168	180	6	8	0
34 FT	26	29	15	9	7	7	6	60.5	51.0	54.4	57.6	9	7.5	6	6	50.8	157	169	181	6	8	0
36 FT	27	30	16	9	7	7	6	60.8	51.5	54.9	58.3	9	7	6	6	51.0	158	170	182	6	8	0
38 FT	28	31	16	9	6.5	7	6	60.8	52.1	55.5	58.8	9	7	6	6	51.0	159	171	183	6	8	0
40 FT	29	32	17	9	6.5	7	6	61.1	54.5	58.0	61.5	9	7	6	6	51.3	160	172	184	6	7.5	0
42 FT	31	33	17	9	6.5	7	7	61.1	55.4	58.9	62.4	9	7	6	6	51.3	161	173	185	6	7.5	0
44 FT	32	34	17	9	6.5	7	6.5	61.1	57.9	61.5	65.1	9	6.5	6	6	51.3	162	174	186	6	7.5	0
46 FT	33	35	17	9	6	7	6	61.1	58.5	62.1	65.8	9	6.5	6	6	53.3	163	175	187	6	7.5	0
48 FT	34	36	18	9	6	7	7	61.4	59.1	62.8	66.3	9	6.5	6	6	53.5	164	176	188	6	7	0
50 FT 34 37 18 9 6 7 6 61.4 59.4 63.0 66.6										66.6	9	6.5	6	6	53.5	165	177	189	6	7	0	

GENERAL NOTES:

IF DESIGN FILLES.

IF DESIGN FILLES.

FILE THE PROBLEM FI

SPECIAL DESIGNS ARE REQUIRED WHEN THE DESIGN FILL IS LESS THAN 1 FOOT OR GREATER THAN 50 FEET.

DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.

DESIGN FILLS ARE MEASURED FROM THE TOP OF TOP SLAB TO THE TOP OF EARTH FILL OR ROADWAY.

CULVERTS MEET STRENGTH AND SERVICEABILITY REQUIREMENTS FOR THE DESIGN VEHICULAR LIVE LOAD HL-93 MINUS THE LANE LOAD.



MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)



MEMBER THICKNESS BAR SIZE, SPACING & DIMENSIONS

SPAN (S): 15 FEET HEIGHT (HT): 8 THRU 16 FEET

DATE PREPARED:

THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

DATE EFFECTIVE: 04/01/2011 4/18/2011

703.17

SHEET NO. 13 OF 14

I	SPAN (S) = 16 FT HEIGH													Γ) =	8 F	T OR	9 FT	OR	10 FT				
ΙГ								TOP								зотток	√ SLAB				WAL		
	SIGN	TH:	CKNE	ESS	A1	BARS			J3	BARS			A2	BARS			J4	BARS			Ba	2 BARS	5
ll F	ILL	TS	BS	тх	SIZE	SPA.	SIZE	SPA.	C1	HT=8'	K2 HT=9'	HT=10'	SIZE	SPA.	SIZE	SPA.	C4	HT=8'	K3 HT=9'	HT=10	SIZE	SPA.	G1
1	FT	12	13	8	7	6.5	6	6.5	116.0	37.1	41.0	44.8	7	7.5	6	6.5	76.0	105	117	129	5	12	12
2	FT	12	13	8	7	6	6	6	116.0	37.1	41.0	44.8	7	7	6	6	64.0	105	117	129	5	12	12
4	FT	12	12	9	7	6.5	6	6.5	54.3	36.8	40.6	44.5	7	6.5	6	6	54.3	104	116	128	5	12	0
- 6	FT	12	12	9	7	6	6	6.5	50.3	36.8	40.6	44.5	7	6	6	6	50.3	104	116	128	5	12	0
8	FT	12	13	9	8	7.5	7	6.5	50.3	37.1	41.0	44.8	8	7	6	6	46.3	105	117	129	5	12	0
1.0	O FT	13	14	9	8	6.5	7	6.5	48.3	37.8	41.6	45.5	8	6.5	6	6	44.3	106	118	130	5	12	0
1;		14	16	9	8	6.5	7	6.5	46.3	35.1	38.6	42.0	8	6.5	6	7.5	40.3	108	120	132	5	12	0
1.		15	18	9	8	6	7	6	52.3	36.0	39.5	42.9	8	6	6	8	38.3	110	122	134	5	12	0
10		16	19	9	9	7	7	6	50.3	36.5	40.0	43.5	8	6	6	7.5	38.3	111	123	135	5	12	0
13		17	20	9	9	7	7	6.5	50.3	37.1	40.6	44.1	8	6	6	8	38.3	112	124	136	5	12	0
2		19	21	9	9	7	7	7	50.3	39.3	42.9	46.5	8	6	6	7.5	38.3	113	125	137	5	10.5	0
2:		20	23	9	9	6.5	7	6.5	50.3	40.3	43.8	47.4	8	6	6	7.5	38.3	115	127	139	5	9	0
2.		22	24	10	9	7	7	7.5	50.5	42.5	46.3	49.9	9	7.5	6	7.5	38.4	116	128	140	5	9.5	0
2		23	25	10	9	6.5	7	7	50.5	47.3	51.4	55.4	9	7	6	7	38.4	117	129	141	5	8.5	0
2		25	27	11	9	6.5	6	6	46.8	45.8	49.6	53.5	9	7	6	8	40.6	119	131	143	5	8.5	0
3		26	28	11	9	6.5	6	6	46.8	46.4	50.3	54.1	9	7	6	8	40.6	120	132	144	5	7.5	0
3:		28	29	11	9	6.5	6	6.5	46.8	53.3	57.6	61.9	9	7	6	7	40.6	121	133	145	5	7.5	0
3-		29	31	12	9	6.5	6	6.5	46.9	54.4	58.6	63.0	9	7	6	7.5	40.8	123	135	147	5	7	0
3:		30	33	12	9	6	6	6.5	46.9	55.1	59.4	64.5	9	6.5	6	7.5	40.8	124	137	148	5	7	0
4		32	34	12	9	6	6	6.5	46.9	56.5	60.9	65.1	9	6.5	6	7	40.8	126	138	150	5	7	0
4		33	35	12	9	6	6	6	46.9	57.3	61.5	65.9	9	6.5	6	6.5	40.8	127	139	151	5	6.5	0
4.		34	36	13	10	7.5	6	6.5	47.1	59.6	64.0	68.5	9	6	6	6.5	41.0	128	140	152	5	6.5	0
	6 FT	35	37	13	10	7	6	6	47.1	60.3	64.8	69.3	9	6	6	6.5	41.0	129	141	153	5	6.5	0
4		36	38	13	10	7	6	6.5	47.1	61.0	65.5	69.9	9	6	6	6	41.0	130	142	154	5	6	0
5		37	39	13	10	7	6	6.5	47.1	61.8	66.3	70.6	9	6	6	6	41.0	131	143	155	6	8.5	0
1 2	0 11	JI	77	113	1 10		1 0	_ •	71.1	101.0	1 00.3	10.0		_ •	_ 0		71.0	131	143	1 133	_ 0	0.0	1 0

																						\neg
	MEMBER TOP SLAB BARS DESIGN THICKNESS AT BARS J3 BARS													E	вотто	/ SLAB	BARS			₩AI		
DESIGN	THI	CKNE	ESS	A1	BARS			J3	BARS			A2	BARS			J4	BARS			B:	2 BARS	ŝ
FILL	TS	BS	тх	SIZE	SPA.	SIZE	SPA.	C1	HT=11'	K2 HT=12'	HT=13'	SIZE	SPA.	SIZE	SPA.	C4	HT=11'	K3 HT=12	HT=13	SIZE	SPA.	G1
1 FT	12	14	9	7	6.5	6	6	116.6	36.8	39.6	42.5	7	7.5	6	6	116.6	142	154	166	5	8.5	12
2 FT	13	14	10	7	7	6	7	117.1	38.5	41.5	44.5	7	7.5	6	6	101.0	142	154	166	5	8.5	12
4 FT	12	13	10	7	6.5	6	6.5	72.8	36.5	39.4	42.3	7	6.5	6	6.5	74.8	141	153	165	5	8.5	0
6 FT	12	13	10	7	6	6	6	62.6	36.5	39.4	42.3	7	6	6	6	64.6	141	153	165	5	8.5	0
8 FT	12	14	10	7	6	7	6	62.6	36.8	39.6	42.5	8	7.5	6	6	60.6	142	154	166	5	8.5	0
10 FT	13	15	11	8	7.5	7	6.5	60.9	37.3	40.1	43.0	8	7	6	6.5	56.9	143	155	167	5	9	0
12 FT	14	16	11	8	6.5	7	6.5	58.9	39.3	42.3	45.3	8	6.5	6	6	54.8	144	156	168	5	8.5	0
14 FT	15	17	11	8	6	7	6	65.0	46.1	49.6	53.1	8	6	7	7	56.9	145	157	169	5	8	0
16 FT	16	19	12	8	6	7	6	65.3	40.5	43.5	46.5	8	6	6	6	53.0	147	159	171	5	8	0
18 FT	17	20	12	8	6	7	6.5	61.3	41.0	44.0	47.0	8	6	6	6.5	49.0	148	160	172	5	9	0
20 FT	19	21	12	8	6	7	6.5	59.1	43.4	46.5	49.6	8	6	6	6	49.0	149	161	173	5	7.5	0
22 FT	20	23	13	9	7.5	7	6.5	61.5	44.3	47.4	50.5	8	6	6	6.5	49.3	151	163	175	5	8	0
24 FT	22	24	13	9	7	7	6.5	59.5	46.8	50.0	53.3	9	7.5	6	6	49.3	152	164	176	5	6.5	0
26 FT	23	26	14	9	7	7	6.5	59.8	47.5	50.8	54.0	9	7.5	6	6.5	49.5	154	166	178	5	7	0
28 FT	24	27	14	9	7	7	6.5	59.8	48.0	51.3	54.5	9	7	6	6	49.5	155	167	179	5	6	0
30 FT	26	28	14	9	6.5	7	6	59.8	50.6	54.0	57.4	9	7	6	6	49.5	156	168	180	5	6	0
32 FT	27	29	15	9	6.5	7	6.5	60.0	51.3	54.6	58.0	9	7	6	6	49.6	157	169	181	5	6	0
34 FT	28	31	15	9	6.5	7	6	60.0	52.1	55.5	58.8	9	7	6	6	49.6	159	171	183	6	8	0
36 FT	29	32	16	9	6.5	7	6.5	60.4	54.5	58.0	61.5	9	6.5	6	6	49.9	160	172	184	6	8	0
38 FT	30	33	16	9	6	7	6	60.4	55 - 1	58.6	62.0	9	6.5	6	6	49.9	161	173	185	6	8	0
40 FT	32	34	16	9	6	7	6.5	60.4	57.9	61.5	65.1	9	6.5	6	6	49.9	162	174	186	6	8	0
42 FT	33	35	17	9	6	7	7	60.6	58.5	62.1	65.8	9	6.5	6	6	50.1	163	175	187	6	7.5	0
44 FT	34	36	17	9	6	7	7	60.6	59.1	62.8	66.3	9	6	6	6	50.1	164	176	188	6	7.5	0
46 FT	35	37	17	10	7.5	7	6.5	60.6	59.8	63.3	66.9	9	6	6	6	50.1	165	177	189	6	7.5	0
48 FT	36	38	18	10	7	7	7	60.9	60.3	63.9	67.5	9	6	6	6	52.5	166	178	190	6	7	0
50 FT	37	39	18	10	7	7	7	60.9	62.9	66.6	70.4	9	6	6	6	52.5	167	179	191	6	7	0

SPAN (S) = 16 FT HEIGHT (HT) = 14 FT OR 15 FT OR 16 FT MEMBER TOP SLAB BARS BOTTOM SLAB BARS WALL BARS																						
							TOP	SLAB E	BARS						вотток	/ SLAB	BARS			WAL	L BAF	คร
DESIGN	TH	CKNE	SS	A1	BARS			J3	BARS			A2	BARS			J4	BARS			Ba	BAR	S
FILL	TS	BS	TX	SIZE	SPA.	SIZE	SPA.	C1	HT=14'	K2 HT=15'	HT=16'	SIZE	SPA.	SIZE	SPA.	C4	HT=14	K3 HT=15	HT=16	SIZE	SPA.	G1
1 FT	13	14	11	7	7.5	6	7	117.8	38.0	40.4	42.8	7	7.5	6	6.5	117.8	178	190	202	5	7.5	12
2 FT	13	14	11	7	7	7	7.5	121.8	38.0	40.4	42.8	7	7	6	6.5	117.8	178	190	202	5	7	12
4 FT	12	14	11	7	6.5	6	6	117.8	37.8	40.3	42.6	7	6.5	6	6	117.8	178	190	202	5	6.5	0
6 FT	12	14	12	7	6.5	6	6	83.6	37.8	40.3	42.6	7	6.5	6	6	95.9	178	190	202	5	7	0
8 FT	12	14	13	7	6.5	7	6.5	77.9	37.8	40.3	42.6	7	6	6	6	80.0	178	190	202	5	6.5	0
10 FT	13	16	13	7	6	7	6.5	75.9	38.4	40.8	43.3	8	7.5	6	6	77.9	180	192	204	5	6.5	0
12 FT	14	17	14	7	6	7	6.5	72.1	40.8	43.3	45.8	8	7	7	8	76.3	181	193	205	5	6	0
14 FT	16	18	14	8	7	7	6.5	78.3	45.3	48.1	50.9	8	6.5	7	7	74.1	182	194	206	5	6	0
16 FT	17	19	15	8	7	7	6.5	78.6	47.8	50.6	53.5	8	6.5	7	6.5	72.5	183	195	207	6	8	0
18 FT	17	20	15	8	6.5	7	6.5	72.5	42.0	44.5	47.0	8	6	7	7.5	66.3	184	196	208	6	8	0
20 FT	19	21	15	8	6.5	7	6	72.5	50.8	53.8	56.8	8	6	7	6.5	66.3	185	197	209	6	8	0
22 FT	20	23	16	8	6	7	6	72.8	45.4	48.0	50.6	8	6	7	7	66.5	187	199	211	6	8	0
24 FT	22	24	16	8	6	7	6	72.8	52.3	55.3	58.3	9	7.5	7	6.5	66.5	188	200	212	6	8	0
26 FT	23	26	17	8	6	7	6	73.1	50.9	53.8	56.6	9	7.5	7	7	66.9	190	202	214	6	7.5	0
28 FT	24	27	18	9	7	7	6	73.5	51.4	54.3	57.1	9	7	7	7	67.3	191	203	215	6	7	0
30 FT	26	28	18	9	7	7	6	73.5	56.4	59.5	62.6	9	7	7	6.5	67.3	192	204	216	6	7	0
32 FT	27	30	19	9	7	7	6	73.9	55.0	58.0	61.0	9	7	7	7	67.5	194	206	218	6	6.5	0
34 FT	28	31	20	9	7	7	6	74.3	55.5	58.5	61.5	9	7	7	7	67.9	195	207	219	6	6.5	0
36 FT	29	32	21	9	6.5	7	6	74.5	53.8	56.6	59.5	9	6.5	7	7	68.1	196	208	220	6	6.5	0
38 FT	30	33	22	9	6.5	7	6	74.9	61.0	64.3	67.5	9	6.5	7	7	68.5	197	209	221	6	6.5	0
40 FT	31	34	22	9	6.5	7	6	74.9	61.5	64.8	68.0	9	6.5	7	7	68.5	198	210	222	6	6	0
42 FT	32	35	23	9	6.5	7	6	75.3	62.1	65.4	68.6	9	6.5	7	7	68.8	199	211	223	6	6	0
44 FT	34	36	23	9	6	7	6	75.3	65.3	68.6	72.0	9	6	7	6.5	68.8	200	212	224	7	8	0
46 FT	35	37	24	9	6	7	6	75.6	65.8	69.1	72.5	9	6	7	6.5	69.1	201	213	225	6	6	0
48 FT	36	38	24	9	6	7	6	75.6	66.4	69.8	73.1	9	6	7	7	69.1	202	214	226	7	7.5	0
50 FT	37	39	25	9	6	7	6	76.0	69.3	72.8	76.3	9	6	7	7	69.5	203	215	227	7	7.5	0

GENERAL NOTES:

IF DESIGN FILLES.

IF DESIGN FILLES.

FILE THE PROBLEM FI

SPECIAL DESIGNS ARE REQUIRED WHEN THE DESIGN FILL IS LESS THAN 1 FOOT OR GREATER THAN 50 FEET.

DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.

DESIGN FILLS ARE MEASURED FROM THE TOP OF TOP SLAB TO THE TOP OF EARTH FILL OR ROADWAY.

CULVERTS MEET STRENGTH AND SERVICEABILITY REQUIREMENTS FOR THE DESIGN VEHICULAR LIVE LOAD HL-93 MINUS THE LANE LOAD.



ALTERNATE J3 BAR



105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)



m

CONCRETE SINGLE BOX CULVERT

MEMBER THICKNESS BAR SIZE, SPACING & DIMENSIONS

SPAN (S): 16 FEET HEIGHT (HT): 8 THRU 16 FEET

DATE EFFECTIVE: 04/01/2011 DATE PREPARED:

4/18/2011

703.17

SHEET NO. 14 OF 14

	J3 BAR	2" CL. (J3, B2)
_\Z		<u>† </u>
	☐ A1 BAR	1½" CL. (TYP.)
		B2 BAR
χ Σ	<u> </u>	TX 2"
	A2 BAR	CL.
. ↓		- S
	J4 BAR C4	3" CL. (J4, B2)
	BAR DIMENSION	S DIAGRAM

SYMMETRICAL ABOUT & CULVERT.

		AREA	OF ST					BARS WALL			(SQ.	IN./F	T.)			
						① Back	fill S	lope =	2:1							
Wall Thickness							Wa	II Hei	aht (f	t.)						
TX (in.)	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
8	0.168	0.168	0.197	0.291	0.414	0.429	0.578	0.766	1.003							
9	0.168	0.168	0.168	0.244	0.346	0.456	0.477	0.626	0.809	1.034	1.312					
			0.168													
11	0.168	0.168	0.168	0.185	0.261	0.357	0.475	0.520	0.592	0.746	0.929	1.147	1.405			
12		0.168	0.168	0.168	0.233	0.318	0.422	0.548	0.554	0.658	0.816	1.002	1.220	1.475		
13		0.168	0.168	0.168	0.210	0.287	0.380	0.493	0.588	0.589	0.729	0.892	1.081	1.301		
14														1.167		
15														1.059		
16					0.168	0.222	0.293	0.379	0.481	0.601	0.693	0.693	0.813	0.971	1.151	
17					0.168	0.206	0.273	0.352	0.447	0.557	0.686	0.729	0.752	0.897	1.061	1.24
18							0.255							0.834		
19														0.800		
20								0.291						0.836		
21									0.348					0.871		
22										0.411				0.870		
23														0.826		
24											0.456			0.786		
25												0.527		0.750		
26													0.604	0.717		
27	l	1	1	l	1	1	l	1	1		1	1		0.686	0.807	0.94

ADEA OF CITE PROVIDED FOR IT DADG IN WINGS (CO. IN CIT.)																
AREA OF STEEL REQUIRED FOR J5 BARS IN WINGS (SO. IN./FT.) WALL HEIGHT VS. WALL THICKNESS																
① Backfill Slope = 3:1																
Wall Thickness		Wall Height (ft.)														
TX (in.)	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
8	0.168	0.168	0.168	0.187	0.264	0.362	0.425	0.475	0.612							
9	0.168	0.168	0.168	0.168	0.222	0.303	0.403	0.456	0.504	0.637	0.795					
10	0.168	0.168	0.168	0.168	0.191	0.261	0.346	0.450	0.487	0.541	0.671	0.824	1.005	1.217		
11	0.168	0.168	0.168	0.168	0.168	0.229	0.304	0.394	0.501	0.520	0.583	0.713	0.864	1.039		
12		0.168	0.168	0.168	0.168	0.204	0.271	0.351	0.445	0.554	0.554	0.629	0.760	0.910		
13		0.168	0.168	0.168	0.168	0.185	0.244	0.316	0.401	0.501	0.588	0.588	0.679	0.812	0.963	
14			0.168	0.168	0.168	0.168	0.223	0.288	0.365	0.455	0.560	0.623	0.623	0.733	0.868	
15				0.168	0.168	0.168	0.204	0.264	0.335	0.417	0.513	0.623	0.658	0.669	0.791	
16					0.168	0.168	0.189	0.244	0.309	0.385	0.474	0.575	0.690	0.693	0.727	
17					0.168	0.168	0.176	0.227	0.287	0.358	0.440	0.533	0.640	0.729	0.729	0.788
18							0.168	0.212	0.269	0.334	0.411	0.498	0.597	0.709	0.764	0.764
19								0.199	0.252	0.314	0.385	0.467	0.559	0.664	0.782	0.800
20								0.188	0.237	0.295	0.362	0.439	0.526	0.625	0.735	0.836
21									0.224	0.279	0.342	0.415	0.497	0.590	0.694	0.810
22										0.265	0.325	0.393	0.471	0.558	0.657	0.766
23														0.530		
24											0.294	0.356	0.426	0.505	0.594	0.692
25												0.340	0.407	0.482	0.566	0.661
26																0.632
27														0.442	0.519	0.605

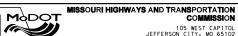
NOTE:

THE WALL HEIGHT IS EQUAL TO THE BARREL HEIGHT (HT) PLUS THE TOP SLAB THICKNESS (TS). WHEN WALL HEIGHT IS IN BETWEEN OR DUISIDE TABULATED WALL HEIGHTS. THE AREA OF STEEL GEOUIRED SHOULD BE INTERPOLATED BETWEEN OR EXTRAPOLATED FROM ADJACENT AREAS OF STEEL USING THE ACTUAL WALL HEIGHT.

IF AREA OF STEEL IN THE WALL OF THE CULVERT (J4 BARS) IS GREATER THAN THAT INDICATED IN THE TABLE. USE THE SAME SIZE AND SPACING FOR THE J5 BARS IN THE WINDS. HOWEVER, IF THE AREA OF STEEL PROVIDED BY MATCHING SIZE AND SPACING OF THE J4 BARS IS INSUFFICIENT NORTH SETTING SIZE AND SPACING OF THE J4 BARS IS INSUFFICIENT NORTH SETTING SIZE AND SPACING OF THE J4 BARS IS AND THE J5 BARS (J5 MARS) AND THE J5 MARS (J5 MARS (J5 MARS) AND THE J5 MARS (J5 MARS) AND THE J5 MARS (J5 MARS (J5 MARS) AND THE J5 MARS (J5 M

MINIMUM STEEL TO BE USED IN THE WINGS FOR J5 BARS IS #4 BARS AT 14" CENTERS (AREA OF STEEL = 0.1683 SO. IN./FT.)

O SEE STANDARD PLAN 703.37C. SHEET 2 OF 2 FOR BACKFILL SLOPE TO BE USED BASED ON SKEW.



105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)



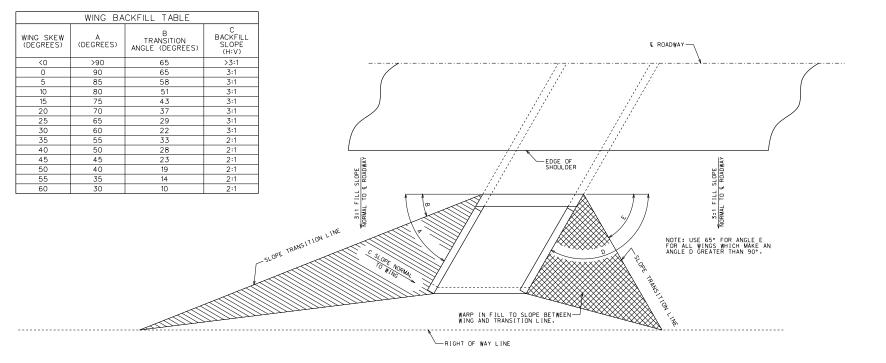
CONCRETE BOX CULVERT

EXTERIOR WING REINFORCEMENT

DATE EFFECTIVE: DATE PREPARED:

04/01/2011 4/18/2011

703.37C





NOTE: BACKFILL TRANSITION ANGLE AND BACKFILL SLOPE SHALL APPLY TO ALL BOX CULVERTS REGARDLESS OF TYPE - SINGLE, DOUBLE, OR TRIPLE.



105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)



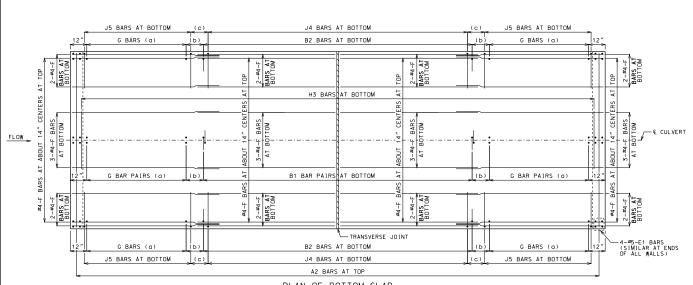
CONCRETE BOX CULVERT

EXTERIOR WING BACKFILL SLOPE TRANSITION

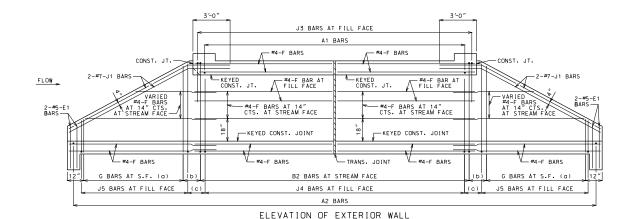
DATE EFFECTIVE: DATE PREPARED:

04/01/2011 4/18/2011

703.37C



PLAN OF BOTTOM SLAB



J1 BARS MAY BE BENT IN FIELD OR SHOP.

LAYING OUT TRANVERSE JOINTS UNLESS SHOWN ON BRIDGE PLANS

USE A TRANSVERSE JOINT WHEN BARREL LENGTH IS OVER 80 FEET. USE ADDITIONAL JOINTS TO LIMIT CUT SECTION LENGTH AND END SECTION BARREL LENGTH MEASURED ALONG CENTERLINE OF CULVERT TO 50 FEET.

MINIMUM END SECTION LENGTH SHALL BE 3 FEET MEASURED ALONG THE SHORTEST WALL FROM THE INSIDE FACE OF HEADWALL TO THE TRANSVERSE JOINT.

TO AVOID LOCATING TRANSVERSE JOINTS UNDER A TRAVELED WAY WITH DESIGN FILLS 2 FEET OR LESS THE FOLLOWING SHALL APPLY:

BARREL LENGTH UP TO 90 FEET WITHOUT A TRANSVERSE JOINT

CUT SECTION LENGTHS UP TO 60 FEET

WHEN BARREL AND CUT SECTION LENGTH RESTRICTIONS REQUIRE TRANSVERSE JOINTS TO BE LOCATED UNDER A TRAVELED WAY WITH DESIGN FILLS 2 FEET OR LESS. THE JOINTS SHALL BE LOCATED TO MINIMIZE THE LENGTH OF JOINT UNDER THE TRAVELED WAY.

TRAVELED WAY IS THE ROADWAY WIDTH MINUS SHOULDER WIDTHS.

FOR CUT SECTION DETAILS. SEE 703.46.

GENERAL NOTES:

FOR SECTIONS THRU BARREL. WINGS AND HEADWALLS, SEE SHEET 3 OF 3. FOR BAR SIZES. SPACING AND DIMENSIONS OF ALL REINFORCEMENT EXCEPT JS BARS. SEE 703.47. FOR JS BARS. SEE 703.37.

CONSTRUCTION JOINT KEY NOT SHOWN FOR CLARITY IN PLAN AND ELEVATION. SEE SHEET 3 OF 3 FOR DETAILS.

DRAWING NOT TO SCALE. FOLLOW DIMENSIONS.

MINIMUM CLEARANCE TO REINFORCING STEEL SHALL BE 11/2".

LAP LONGITUDINAL BARS A MINIMUM OF 23" AT SPLICES.

BEVELED HEADWALL SHALL BE LOCATED AT UPSTREAM END.

(a) SAME SIZE AND SPACING AS ADJACENT B BARS

(b) VARIES, 12" MAXIMUM

(c) J4 BAR SPACING



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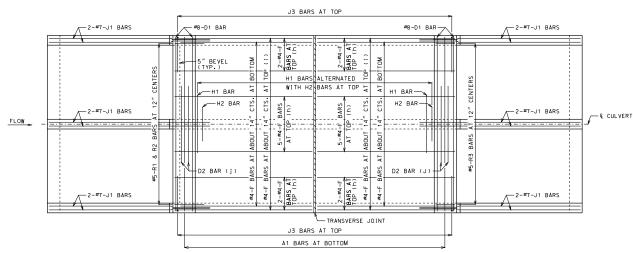
CONCRETE DOUBLE BOX CULVERT

SKEW: SQUARED WINGS: STRAIGHT

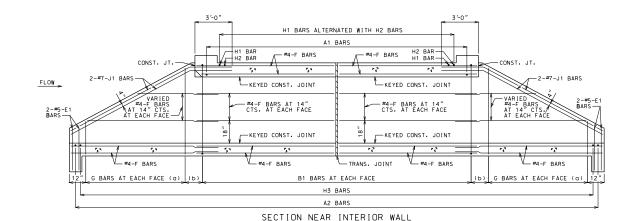
REINFORCEMENT

DATE EFFECTIVE: 10/01/2011 DATE PREPARED:

703.40H



PLAN OF TOP SLAB
B BARS IN WALLS ARE NOT SHOWN FOR CLARITY.
FOR PLACEMENT, SEE SHEET 1 OF 3.



J1 BARS MAY BE BENT IN FIELD OR SHOP.

GENERAL NOTES:

FOR SECTIONS THRU BARREL. WINGS AND HEADWALLS, SEE SHEET 3 OF 3. FOR BAR SIZES, SPACING AND DIMENSIONS OF ALL REINFORCEMENT EXCEPT JS BARS, SEE 703.47. FOR JS BARS, SEE 703.37.

CONSTRUCTION JOINT KEY NOT SHOWN FOR CLARITY IN PLAN AND SECTION, SEE SHEET 3 OF 3 FOR DETAILS.

DRAWING NOT TO SCALE. FOLLOW DIMENSIONS.

MINIMUM CLEARANCE TO REINFORCING STEEL SHALL BE 1 1/2".

LAP LONGITUDINAL BARS A MINIMUM OF 23" AT SPLICES.

BEVELED HEADWALL SHALL BE LOCATED AT UPSTREAM END.

(a) SAME SIZE AND SPACING AS ADJACENT B BARS

(b) VARIES. 12" MAXIMUM

(c) NOT SPECIFIED ON THIS SHEET

(d) NOT SPECIFIED ON THIS SHEET

(e) NOT SPECIFIED ON THIS SHEET

(f) NOT SPECIFIED ON THIS SHEET

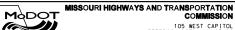
(g) NOT SPECIFIED ON THIS SHEET

(h) FOR DESIGN FILLS OVER 2'-0"

(i) FOR DESIGN FILLS 2'-0" OR LESS

(j) NOT REQUIRED FOR CLEAR SPANS ≤ 10'-0" #8 FOR CLEAR SPAN > 10'-0" #9 FOR CLEAR SPAN > 13'-0"

IF REQUIRED. THE MINIMUM LENGTH EACH SIDE OF © WALL SHALL BE THE GREATER OF 48 BAR DIAMETERS OR 1 CLEAR SPAN. THE CLEAR SPAN IS PARALLEL TO LONG DIRECTION OF HEADWALL.



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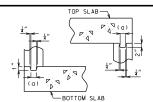
CONCRETE DOUBLE BOX CULVERT

SKEW: SQUARED WINGS: STRAIGHT

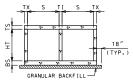
REINFORCEMENT

DATE EFFECTIVE: 10/01/2011 DATE PREPARED:

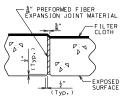
703.40H



KEYED CONSTRUCTION JOINT (a) APPROXIMATELY ONE-THIRD OF WALL



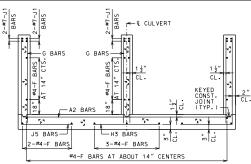
GRANULAR BACKFILL LIMITS AND MEMBER DIMENSIONS



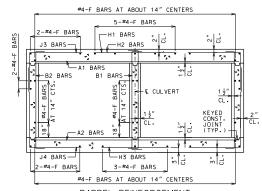
TRANSVERSE JOINT THRU BARREL PREFORMED FIBER EXPANSION JOINT MATERIAL IN ACCORDANCE WITH SEC 1057 SHALL BE SECURELY STITCHED TO ONE FACE OF THE CONCRETE WITH 10 GAGE COPPER WIRE OR 12 GAGE SOFT DRAWN GALVANIZED STEEL WIRE.

FILTER CLOTH 3 FEET IN WIDTH AND DOUBLE
THICKNESS SHALL BE CENTERED ON TRANSVERSE JOINTS
IN TOP SLAB AND SIDEWALLS WITH EOGES SEALED WITH
MASTIC OR TWO SIDED TAPE. FILTER CLOTH SHALL BE
A SUBSURFACE DRAINAGE GEOTEXTILE IN ACCORDANCE
WITH SEC 1011. COST OF FURNISHING AND INSTALLING
FILTER CLOTH WILL BE CONSIDERED COMPLETELY
COVERED BY THE CONTRACT UNIT PRICE FOR OTHER
ITEMS.

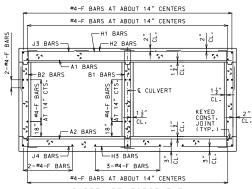
NEAR INTERIOR WALL



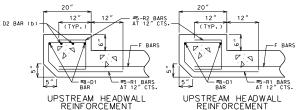
UPSTREAM AND DOWNSTREAM WINGS REINFORCEMENT



BARREL REINFORCEMENT FOR DESIGN FILLS OVER 2'-0"

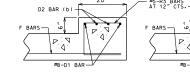


BARREL REINFORCEMENT FOR DESIGN FILLS 2'-0" OR LESS



NEAR MIDSPAN

(b) #8 FOR CLEAR SPAN > 10'-0" #9 FOR CLEAR SPAN > 13'-0" NOT REQUIRED FOR CLEAR SPANS ≤ 10'-0"



DOWNSTREAM HEADWALL REINFORCEMENT NEAR INTERIOR WALL

IF D2 BARS ARE REQUIRED. THE MINIMUM LENGTH EACH SIDE OF % WALL SHALL BE THE GREATER D7 48 BAR D1AMETERS OR \$\frac{1}{2} CLEAR SPAN. THE CLEAR SPAN IS PARALLEL TO LONG DIRECTION OF HEADWALL.



DOWNSTREAM HEADWALL REINFORCEMENT NEAR MIDSPAN

GENERAL NOTES:

FOR MEMBER THICKNESS AND FOR BAR SIZES, SPACING AND DIMENSIONS OF ALL REINFORCEMENT EXCEPT J5 BARS, SEE 703.47. FOR J5 BARS, SEE 703.37.

BARREL AND WINGS SECTIONS ARE SYMMETRICAL ABOUT AND NORMAL TO © CULVERT. HEADWALL SECTIONS ARE NORMAL TO LONG DIRECTION OF HEADWALL.

DRAWING NOT TO SCALE. FOLLOW DIMENSIONS.

MINIMUM CLEARANCE TO REINFORCING STEEL SHALL BE $1\frac{1}{2}$.



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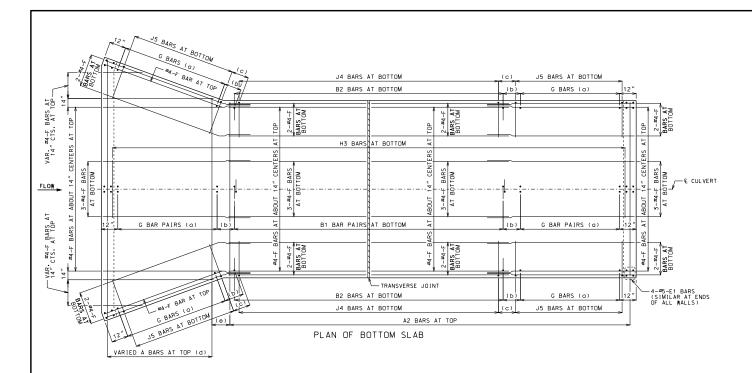
CONCRETE DOUBLE BOX CULVERT

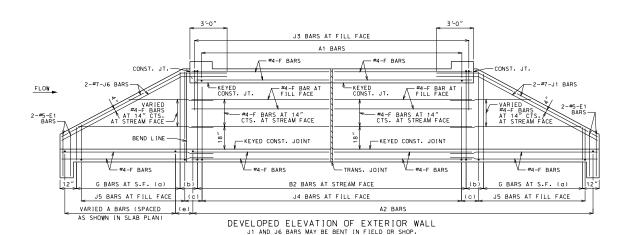
SKEW: SQUARED WINGS: STRAIGHT

SECTIONS

DATE EFFECTIVE: DATE PREPARED: 10/01/2011

703.40H





LAYING OUT TRANVERSE JOINTS

UNLESS SHOWN ON BRIDGE PLANS

USE A TRANSVERSE JOINT WHEN BARREL LENGTH IS OVER 80 FEET. USE ADDITIONAL JOINTS TO LIMIT CUT SECTION LENGTH AND END SECTION BARREL LENGTH MEASURED ALONG CENTERLINE OF CULVERT TO 50 FEET.

MINIMUM END SECTION LENGTH SHALL BE 3 FEET MEASURED ALONG THE SHORTEST WALL FROM THE INSIDE FACE OF HEADWALL TO THE TRANSVERSE JOINT.

TO AVOID LOCATING TRANSVERSE JOINTS UNDER A TRAVELED WAY WITH DESIGN FILLS 2 FEET OR LESS THE FOLLOWING SHALL APPLY:

BARREL LENGTH UP TO 90 FEET WITHOUT A TRANSVERSE JOINT

CUT SECTION LENGTHS UP TO 60 FEET

WHEN BARREL AND CUT SECTION LENGTH RESTRICTIONS REQUIRE TRANSVERSE JOINTS TO BE LOCATED UNDER A TRAVELED WAY WITH DESIGN FILLS 2 FEET OR LESS. THE JOINTS SHALL BE LOCATED TO MINIMIZE THE LENGTH OF JOINT UNDER THE TRAVELED WAY.

TRAVELED WAY IS THE ROADWAY WIDTH MINUS SHOULDER WIDTHS.

FOR CUT SECTION DETAILS. SEE 703.46.

GENERAL NOTES:

FOR SECTIONS THRU BARREL. WINGS AND HEADWALLS, SEE SHEET 3 OF 3. FOR BAR SIZES, SPACING AND DIMENSIONS OF ALL REINFORCEMENT EXCEPT JS BARS, SEE 703.47. FOR JS BARS, SEE 703.37.

CONSTRUCTION JOINT KEY NOT SHOWN FOR CLARITY IN PLAN AND ELEVATION, SEE SHEET 3 OF 3 FOR DETAILS.

DRAWING NOT TO SCALE. FOLLOW DIMENSIONS.

MINIMUM CLEARANCE TO REINFORCING STEEL SHALL BE 1 1/2 ".

LAP LONGITUDINAL BARS A MINIMUM OF 23" AT SPLICES.

BEVELED HEADWALL SHALL BE LOCATED AT UPSTREAM END.

- (a) SAME SIZE AND SPACING AS ADJACENT B BARS
- (b) VARIES. 12" MAXIMUM
- (c) J4 BAR SPACING
- (d) SAME SIZE AND SPACING AS A2 BARS
- (e) A2 BAR SPACING



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CONCRETE DOUBLE BOX CULVERT

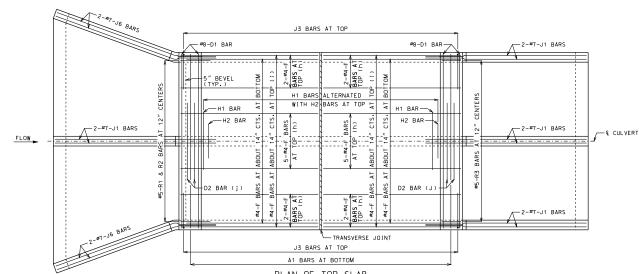
SKEW: SQUARED WINGS: FLARED

REINFORCEMENT

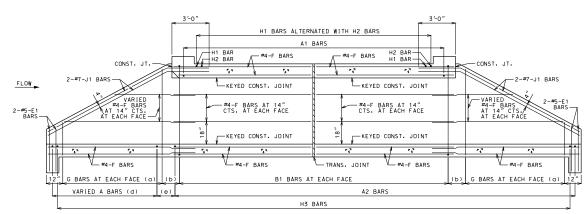
DATE EFFECTIVE: 10/01/2011 DATE PREPARED:

703.41H

SHEET NO. 1 OF 3



PLAN OF TOP SLAB B BARS IN WALLS ARE NOT SHOWN FOR CLARITY. FOR PLACEMENT, SEE SHEET 1 OF 3.



SECTION NEAR INTERIOR WALL J1 BARS MAY BE BENT IN FIELD OR SHOP.

FOR SECTIONS THRU BARREL. WINGS AND HEADWALLS, SEE SHEET 3 OF 3. FOR BAR SIZES, SPACING AND DIMENSIONS OF ALL REINFORCEMENT EXCEPT JS BARS, SEE 703.47. FOR JS BARS, SEE 703.37.

CONSTRUCTION JOINT KEY NOT SHOWN FOR CLARITY IN PLAN AND SECTION, SEE SHEET 3 OF 3 FOR DETAILS.

DRAWING NOT TO SCALE. FOLLOW DIMENSIONS.

MINIMUM CLEARANCE TO REINFORCING STEEL SHALL BE 1 1/2".

LAP LONGITUDINAL BARS A MINIMUM OF 23" AT SPLICES.

BEVELED HEADWALL SHALL BE LOCATED AT UPSTREAM END.

- (a) SAME SIZE AND SPACING AS ADJACENT B BARS
- (b) VARIES. 12" MAXIMUM
- (c) NOT SPECFIED ON THIS SHEET
- (d) SAME SIZE AND SPACING AS A2 BARS
- (e) A2 BAR SPACING
- (f) NOT SPECFIED ON THIS SHEET
- (a) NOT SPECFIED ON THIS SHEET
- (h) FOR DESIGN FILLS OVER 2'-0"
- (i) FOR DESIGN FILLS 2'-0" OR LESS
- (j) NOT REQUIRED FOR CLEAR SPANS ≤ 10'-0" #8 FOR CLEAR SPAN > 10'-0" #9 FOR CLEAR SPAN > 13'-0"

IF REQUIRED. THE MINIMUM LENGTH EACH SIDE OF © WALL SHALL BE THE GREATER OF 48 BAR DIAMETERS OR 1 CLEAR SPAN. THE CLEAR SPAN IS PARALLEL TO LONG DIRECTION OF HEADWALL.



MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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CONCRETE DOUBLE BOX CULVERT



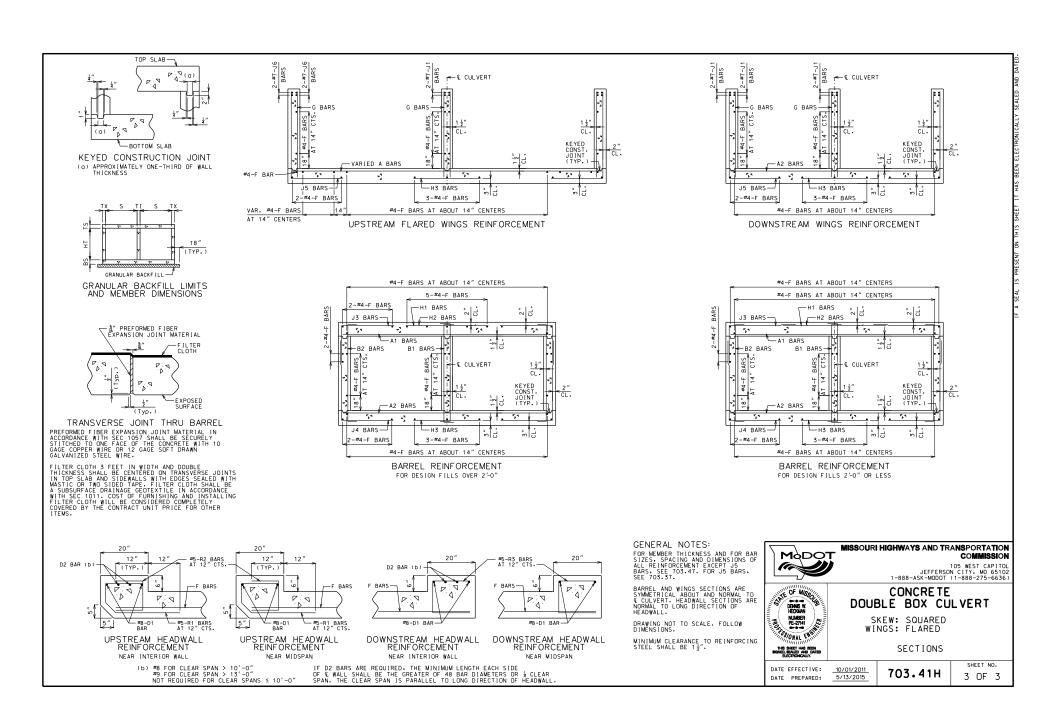
SKEW: SQUARED WINGS: FLARED

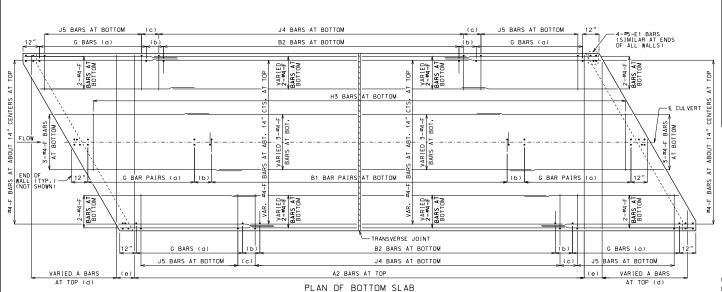
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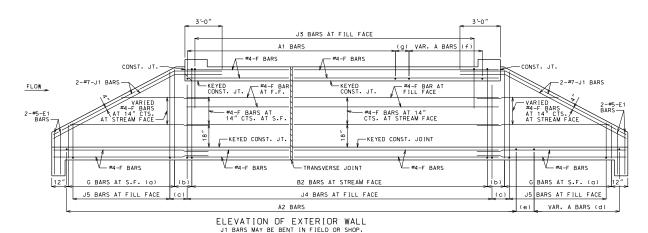
DATE EFFECTIVE: 10/01/2011 DATE PREPARED:

703.41H

SHEET NO. 2 OF 3







LAYING OUT TRANVERSE JOINTS UNLESS SHOWN ON BRIDGE PLANS

USE A TRANSVERSE JOINT WHEN BARREL LENGTH IS OVER 80 FEET. USI ADDITIONAL JOINTS TO LIMIT CUT SECTION LENGTH AND END SECTION BARREL LENGTH MEASURED ALONG CENTERLINE OF CULVETT TO 50 FEET.

MINIMUM END SECTION LENGTH SHALL BE 3 FEET MEASURED ALONG THE SHORTEST WALL FROM THE INSIDE FACE OF HEADWALL TO THE TRANSVERSE JOINT.

TO AVOID LOCATING TRANSVERSE JOINTS UNDER A TRAVELED WAY WITH DESIGN FILLS 2 FEET OR LESS THE FOLLOWING SHALL APPLY:

BARREL LENGTH UP TO 90 FEET WITHOUT A TRANSVERSE JOINT

CUT SECTION LENGTHS UP TO 60 FEET

WHEN BARREL AND CUT SECTION LENGTH RESTRICTIONS REQUIRE TRANSVERSE JOINTS TO BE LOCATED UNDER A TRAVELED WAY WITH DESIGN FILLS 2 FEET OR LESS. THE JOINTS SHALL BE LOCATED TO MINIMIZE THE LENGTH OF JOINT UNDER THE TRAVELED WAY.

TRAVELED WAY IS THE ROADWAY WIDTH MINUS SHOULDER WIDTHS.

FOR CUT SECTION DETAILS. SEE 703.46.

GENERAL NOTES:

FOR SECTIONS THRU BARREL, WINGS AND HEADWALLS, SEE SHEET 3 OF 3. FOR BAR SIZES, SPACING AND DIMENSIONS OF ALL REINFORCEMENT EXCEPT JS BARS, SEE 703.47. FOR JS BARS, SEE 703.47.

CONSTRUCTION JOINT KEY NOT SHOWN FOR CLARITY IN PLAN AND ELEVATION, SEE SHEET 3 OF 3 FOR DETAILS.

DRAWING NOT TO SCALE. FOLLOW DIMENSIONS.

MINIMUM CLEARANCE TO REINFORCING STEEL SHALL BE 1 1/2".

LAP LONGITUDINAL BARS A MINIMUM OF 23" AT SPLICES.

BEVELED HEADWALL SHALL BE LOCATED AT UPSTREAM END.

- (g) SAME SIZE AND SPACING AS ADJACENT B BARS
- (b) VARIES, 12" MAXIMUM
- (c) J4 BAR SPACING
- (d) SAME SIZE AND SPACING AS A2 BARS
- (e) A2 BAR SPACING
- (f) SAME SIZE AND SPACING AS A1 BARS
- (g) A1 BAR SPACING



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CONCRETE DOUBLE BOX CULVERT

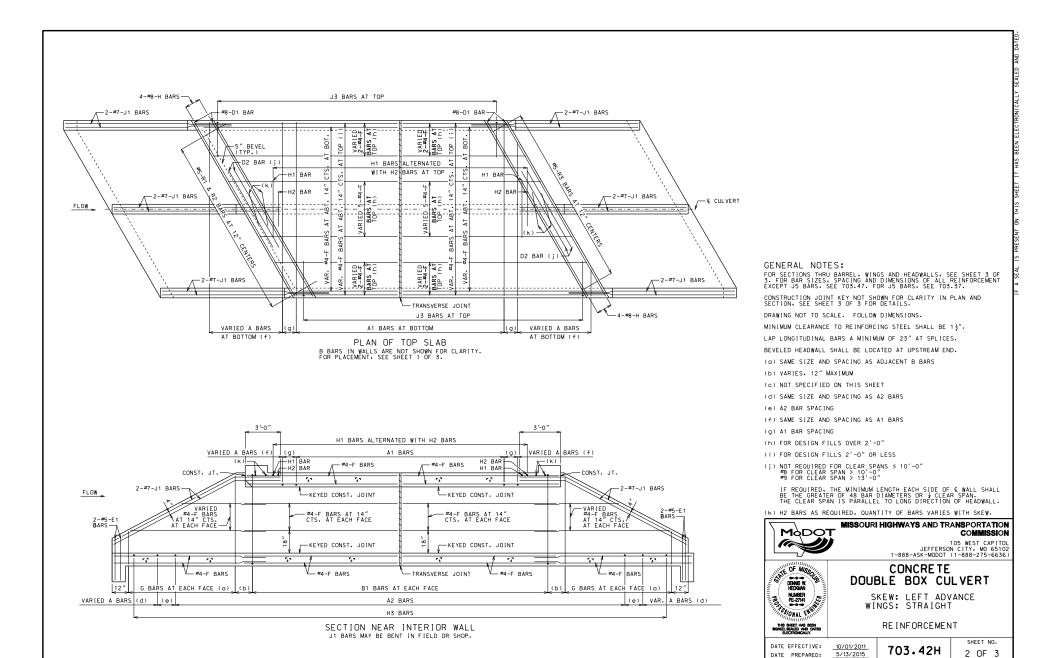
SKEW: LEFT ADVANCE WINGS: STRAIGHT

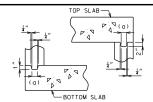
REINFORCEMENT

DATE EFFECTIVE: 10/01/2011 DATE PREPARED:

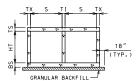
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SHEET NO. 1 OF 3

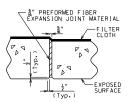




KEYED CONSTRUCTION JOINT
(a) APPROXIMATELY ONE-THIRD OF WALL

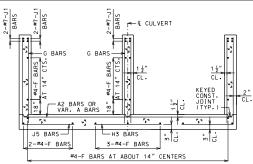


GRANULAR BACKFILL LIMITS AND MEMBER DIMENSIONS

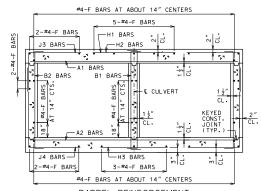


TRANSVERSE JOINT THRU BARREL PREFORMED FIBER EXPANSION JOINT MATERIAL IN ACCORDANCE WITH SEC 1057 SHALL BE SECURELY STITCHED TO ONE FACE OF THE CONCRETE WITH 10 GAGE COPPER WITH OR 12 GAGE SOFT DRAWN GALVANIZED STEEL WITER

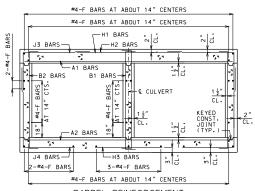
FILTER CLOTH 3 FEET IN WIDTH AND DOUBLE THICKNESS SHALL BE CENTERED ON TRANSVERSE JOINTS IN TOP SLAB AND SIDEWALLS WITH EDGES SEALED WITH MASTIC OR TWO SIDED TAPE. FILTER CLOTH SHALL BE A SUBSURFACE DRAINAGE GEOTEXTILE IN ACCORDANCE WITH SEC TOIL. COST OF FUNNISHING AND INSTALLING FILTER CLOTH WILL BE CONSIDERED COMPLETELY COVERED BY THE CONTRACT UNIT PRICE FOR OTHER JIEMS.



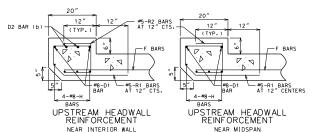
UPSTREAM AND DOWNSTREAM WINGS REINFORCEMENT



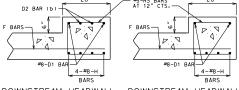
BARREL REINFORCEMENT FOR DESIGN FILLS OVER 2'-0"



BARREL REINFORCEMENT FOR DESIGN FILLS 2'-0" OR LESS



(b) #8 FOR CLEAR SPAN > 10'-0" #9 FOR CLEAR SPAN > 13'-0" NOT REQUIRED FOR CLEAR SPANS ≤ 10'-0"



DWALL DOWNSTREAM HEADWALL DOWN
NT REINFORCEMENT
NEAR INTERIOR WALL
IF DZ BARS ARE REQUIRED. THE MINIMUM LENGTH EACH SIDE

OF & WALL SHALL BE THE GREATER OF 48 BAR DIAMETERS OR 4 CLEAR SPAN. THE CLEAR SPAN IS PARALLEL TO LONG DIRECTION OF HEADWALL.

DOWNSTREAM HEADWALL REINFORCEMENT

INSTREAM HEADWALL MINIMUM CLEARANCE TO REINFORCING STEEL SHALL BE 1½".

GENERAL NOTES:

BARREL AND WINGS SECTIONS ARE SYMMETRICAL ABOUT AND NORMAL TO © CULVERT. HEADWALL SECTIONS ARE NORMAL TO LONG DIRECTION OF HEADWALL.

DRAWING NOT TO SCALE. FOLLOW DIMENSIONS.

FOR MEMBER THICKNESS AND FOR BAR SIZES. SPACING AND DIMENSIONS OF ALL REINFORCEMENT EXCEPT JS BARS, SEE 703.47. FOR JS BARS.

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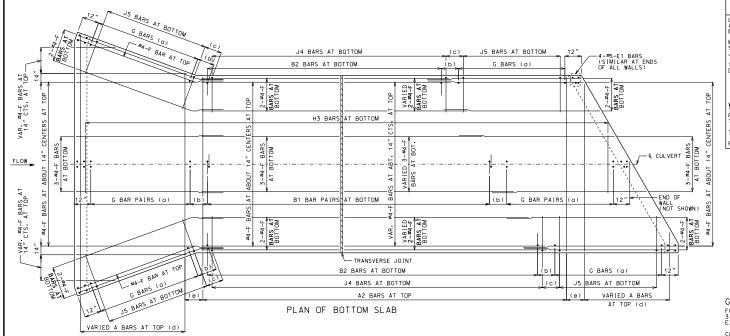
CONCRETE DOUBLE BOX CULVERT

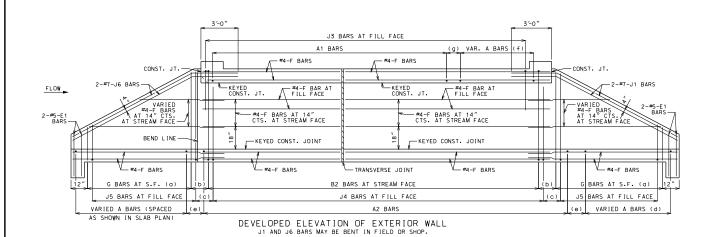
SKEW: LEFT ADVANCE WINGS: STRAIGHT

SECTIONS

DATE EFFECTIVE: DATE PREPARED: 10/01/2011 5/13/2015 703.42H

SHEET NO.





LAYING OUT TRANVERSE JOINTS

UNLESS SHOWN ON BRIDGE PLANS

USE A TRANSVERSE JOINT WHEN BARREL LENGTH IS OVER 80 FEET. USE ADDITIONAL JOINTS TO LIMIT CUT SECTION LENGTH AND END SECTION BARREL LENGTH MEASURED ALONG CENTERLINE OF CULVERT TO 50 FEET.

MINIMUM END SECTION LENGTH SHALL BE 3 FEET MEASURED ALONG THE SHORTEST WALL FROM THE INSIDE FACE OF HEADWALL TO THE TRANSVERSE JOINT.

TO AVOID LOCATING TRANSVERSE JOINTS UNDER A TRAVELED WAY WITH DESIGN FILLS 2 FEET OR LESS THE FOLLOWING SHALL APPLY:

BARREL LENGTH UP TO 90 FEET WITHOUT A TRANSVERSE JOINT

CUT SECTION LENGTHS UP TO 60 FEET

WHEN BARREL AND CUT SECTION LENGTH RESTRICTIONS REQUIRE TRANSVERSE JOINTS TO BE LOCATED UNDER A TRAVELED WAY WITH DESIGN FILLS 2 FEET OR LESS. THE JOINTS SHALL BE LOCATED TO MINIMIZE THE LENGTH OF JOINT UNDER THE TRAVELED WAY.

TRAVELED WAY IS THE ROADWAY WIDTH MINUS SHOULDER WIDTHS.

FOR CUT SECTION DETAILS. SEE 703.46.

GENERAL NOTES:

FOR SECTIONS THRU BARREL, WINGS AND HEADWALLS, SEE SHEET 3 OF 3. FOR BAR SIZES, SPACING AND DIMENSIONS OF ALL REINFORCEMENT EXCEPT JS BARS, SEE 703.47. FOR JS BARS, SEE 703.47.

CONSTRUCTION JOINT KEY NOT SHOWN FOR CLARITY IN PLAN AND ELEVATION, SEE SHEET 3 OF 3 FOR DETAILS.

DRAWING NOT TO SCALE. FOLLOW DIMENSIONS.

MINIMUM CLEARANCE TO REINFORCING STEEL SHALL BE $1\frac{1}{2}$ ".

LAP LONGITUDINAL BARS A MINIMUM OF 23" AT SPLICES.

BEVELED HEADWALL SHALL BE LOCATED AT UPSTREAM END.

- (g) SAME SIZE AND SPACING AS ADJACENT B BARS
- (b) VARIES, 12" MAXIMUM
- (c) J4 BAR SPACING
- (d) SAME SIZE AND SPACING AS A2 BARS
- (e) A2 BAR SPACING
- (f) SAME SIZE AND SPACING AS A1 BARS
- (g) A1 BAR SPACING



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CONCRETE DOUBLE BOX CULVERT

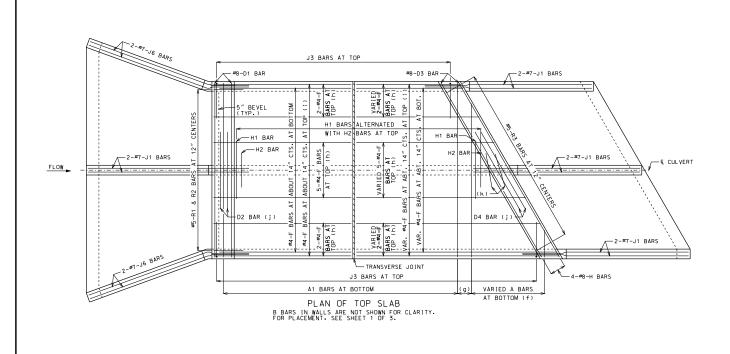
SKEW: LEFT ADVANCE WINGS: FLARED

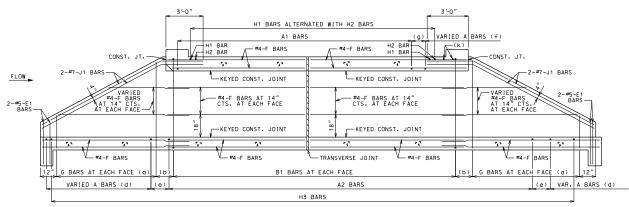
REINFORCEMENT

DATE EFFECTIVE: 10/01/2011 DATE PREPARED:

703.43H

SHEET NO. 1 OF 3





SECTION NEAR INTERIOR WALL J1 BARS MAY BE BENT IN FIELD OR SHOP.

GENERAL NOTES:

FOR SECTIONS THRU BARREL. WINGS AND HEADWALLS, SEE SHEET 3 OF 3. FOR BAR SIZES, SPACING AND DI MENSIONS OF ALL REINFORCEMENT EXCEPT J5 BARS, SEE 703.47.

CONSTRUCTION JOINT KEY NOT SHOWN FOR CLARITY IN PLAN AND SECTION, SEE SHEET 3 OF 3 FOR DETAILS.

DRAWING NOT TO SCALE. FOLLOW DIMENSIONS.

MINIMUM CLEARANCE TO REINFORCING STEEL SHALL BE 1 1/2".

LAP LONGITUDINAL BARS A MINIMUM OF 23" AT SPLICES.

BEVELED HEADWALL SHALL BE LOCATED AT UPSTREAM END.

(a) SAME SIZE AND SPACING AS ADJACENT B BARS

- (b) VARIES, 12" MAXIMUM
- (c) NOT SPECIFIED ON THIS SHEET
- (d) SAME SIZE AND SPACING AS A2 BARS
- (e) A2 BAR SPACING
- (f) SAME SIZE AND SPACING AS A1 BARS
- (g) A1 BAR SPACING
- (h) FOR DESIGN FILLS OVER 2'-0"
- (i) FOR DESIGN FILLS 2'-0" OR LESS
- (j) NOT REQUIRED FOR CLEAR SPANS ≤ 10'-0" #8 FOR CLEAR SPAN > 10'-0" #9 FOR CLEAR SPAN > 13'-0"

IF REQUIRED. THE MINIMUM LENGTH EACH SIDE OF & WALL SHALL BE THE GREAT OF 48 BAR DIAMETERS OR Z LEEAR SPAN. THE CLEAR SPAN IS PARALLEL TO LONG DIRECTION OF HEADWALL.

(k) H2 BARS AS REQUIRED, QUANTITY OF BARS VARIES WITH SKEW.



MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)



CONCRETE DOUBLE BOX CULVERT

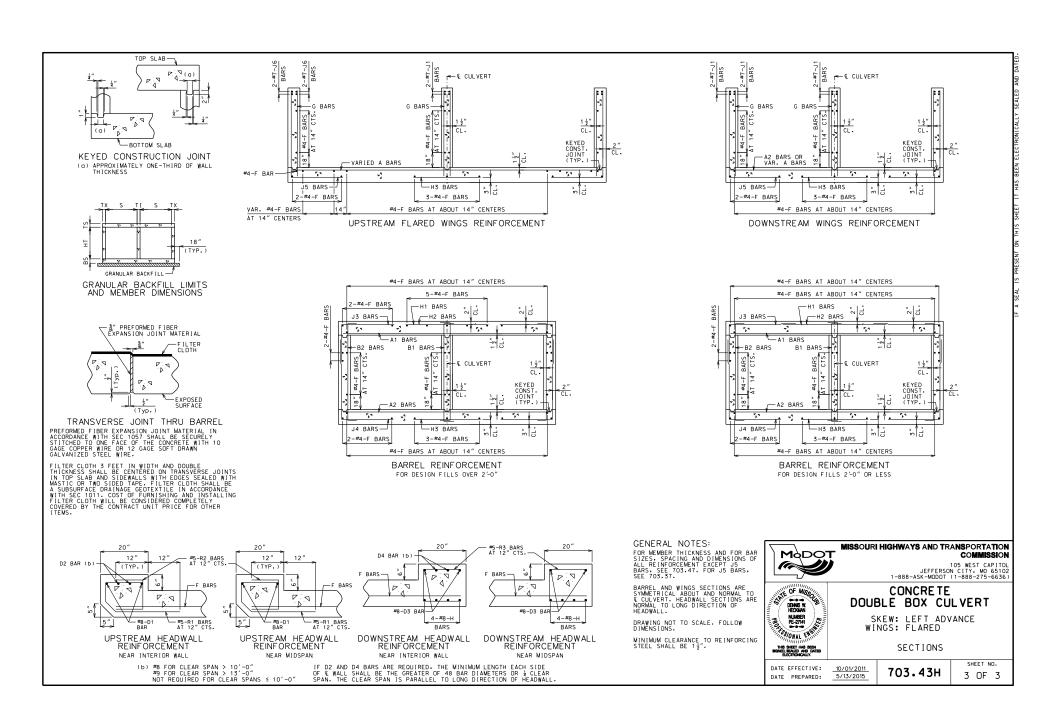
SKEW: LEFT ADVANCE WINGS: FLARED

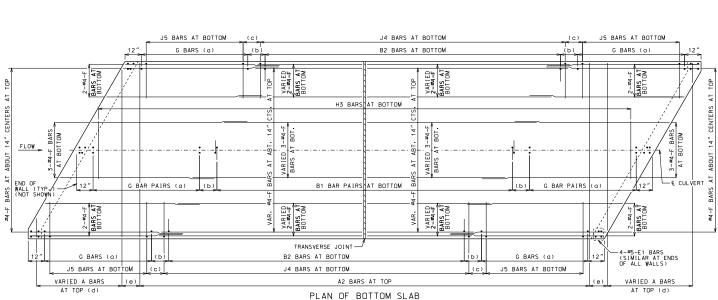
REINFORCEMENT

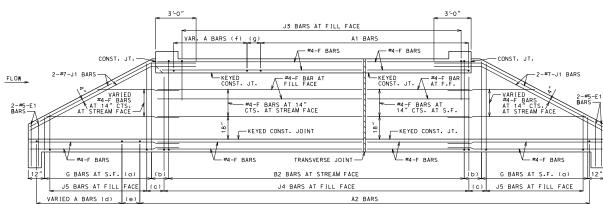
DATE EFFECTIVE: 10/01/2011
DATE PREPARED: 5/13/2015

703.43H

SHEET NO. 2 OF 3







ELEVATION OF EXTERIOR WALL J1 BARS MAY BE BENT IN FIELD OR SHOP.

LAYING OUT TRANVERSE JOINTS UNLESS SHOWN ON BRIDGE PLANS

USE A TRANSVERSE JOINT WHEN BARREL LENGTH IS OVER 80 FEET. USE ADDITIONAL JOINTS TO LIMIT CUT SECTION LENGTH AND END SECTION BARREL LENGTH MEASURED ALONG CENTERLINE OF CULVERT TO 50 FEET.

MINIMUM END SECTION LENGTH SHALL BE 3 FEET MEASURED ALONG THE SHORTEST WALL FROM THE INSIDE FACE OF HEADWALL TO THE TRANSVERSE JOINT.

TO AVOID LOCATING TRANSVERSE JOINTS UNDER A TRAVELED WAY WITH DESIGN FILLS 2 FEET OR LESS THE FOLLOWING SHALL APPLY:

BARREL LENGTH UP TO 90 FEET WITHOUT A TRANSVERSE JOINT

CUT SECTION LENGTHS UP TO 60 FEET

WHEN BARREL AND CUT SECTION LENGTH RESTRICTIONS REQUIRE TRANSVERSE JOINTS TO BE LOCATED UNDER A TRAVELED WAY WITH DESIGN FILLS 2 FEET OR LESS. THE JOINTS SHALL BE LOCATED TO MINIMIZE THE LENGTH OF JOINT UNDER THE TRAVELED WAY.

TRAVELED WAY IS THE ROADWAY WIDTH MINUS SHOULDER WIDTHS.

FOR CUT SECTION DETAILS, SEE 703.46.

GENERAL NOTES:

FOR SECTIONS THRU BARREL, WINGS AND HEADWALLS, SEE SHEET 3 OF 3. FOR BAR SIZES, SPACING AND DIMENSIONS OF ALL REINFORCEMENT EXCEPT JS BARS, SEE 703.47. FOR JS BARS, SEE 703.47.

CONSTRUCTION JOINT KEY NOT SHOWN FOR CLARITY IN PLAN AND ELEVATION. SEE SHEET 3 OF 3 FOR DETAILS.

DRAWING NOT TO SCALE. FOLLOW DIMENSIONS.

MINIMUM CLEARANCE TO REINFORCING STEEL SHALL BE 1 1/2".

LAP LONGITUDINAL BARS A MINIMUM OF 23" AT SPLICES.

BEVELED HEADWALL SHALL BE LOCATED AT UPSTREAM END.

- (g) SAME SIZE AND SPACING AS ADJACENT B BARS
- (b) VARIES, 12" MAXIMUM
- (c) J4 BAR SPACING
- (d) SAME SIZE AND SPACING AS A2 BARS
- (e) A2 BAR SPACING
- (f) SAME SIZE AND SPACING AS A1 BARS
- (g) A1 BAR SPACING

OF MISSOUR

DENNIS W. HECKMAN

NUMBER PE-27141 PE27a



MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)



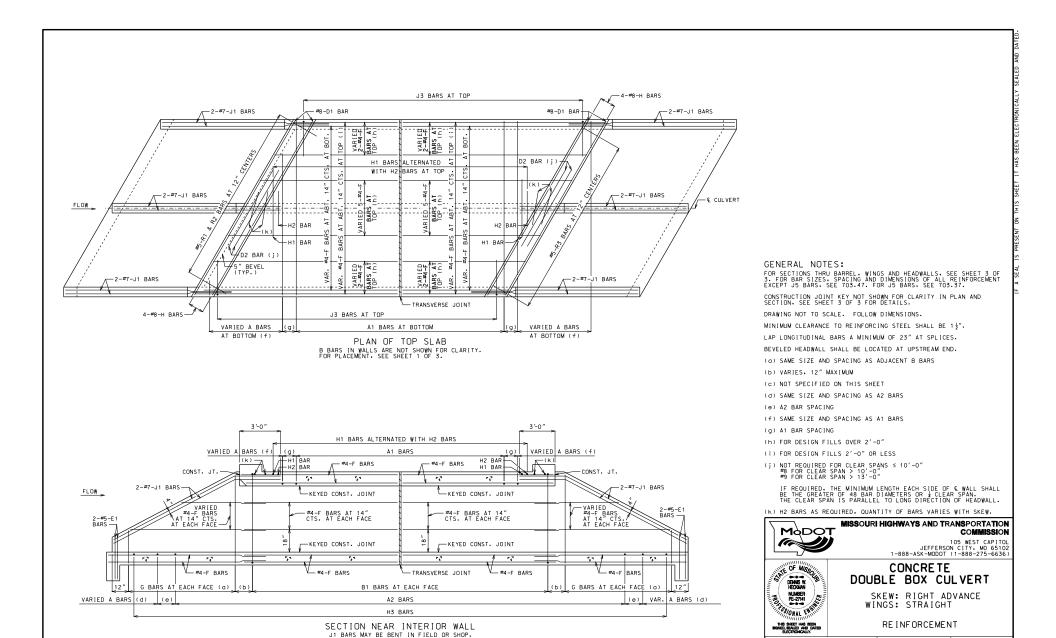
SKEW: RIGHT ADVANCE WINGS: STRAIGHT

REINFORCEMENT

DATE EFFECTIVE: 10/01/2011 DATE PREPARED:

703.44H

SHEET NO. 1 OF 3



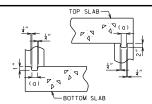
SHEET NO.

2 OF 3

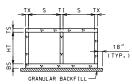
703.44H

DATE EFFECTIVE: 10/01/2011

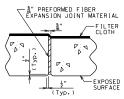
DATE PREPARED:



KEYED CONSTRUCTION JOINT (a) APPROXIMATELY ONE-THIRD OF WALL THICKNESS

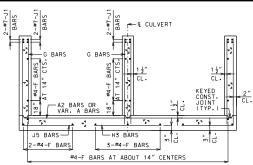


GRANULAR BACKFILL LIMITS AND MEMBER DIMENSIONS

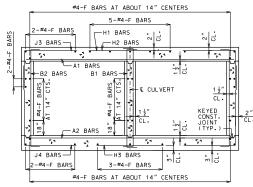


TRANSVERSE JOINT THRU BARREL PREFORMED FIBER EXPANSION JOINT MATERIAL IN ACCORDANCE WITH SEC 1057 SHALL BE SECURELY STITCHED TO ONE FACE OF THE CONCRETE WITH 10 GAGE COPPER WIRE OR 12 GAGE SOFT DRAWN GALVANIZED STEEL WIRE.

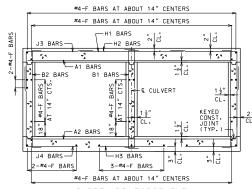
FILTER CLOTH 3 FEET IN WIDTH AND DOUBLE THICKNESS SHALL BE CENTERED ON TRANSVERSE JOINTS IN TOP SLAB AND SIDEWALLS WITH EDGES SEALED WITH MASTIC OR TWO SIDED TAPE. FILTER CLOTH SHALL BE A SUBSURFACE DRAINAGE GEOTEXTILE IN ACCORDANCE WITH SEC TOIL. COST OF FUNNISHING AND INSTALLING FILTER CLOTH WILL BE CONSIDERED COMPLETELY COVERED BY THE CONTRACT UNIT PRICE FOR OTHER JIEMS.



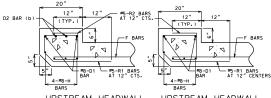
UPSTREAM AND DOWNSTREAM WINGS REINFORCEMENT



BARREL REINFORCEMENT FOR DESIGN FILLS OVER 2'-0"



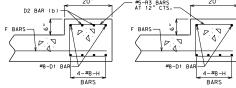
BARREL REINFORCEMENT FOR DESIGN FILLS 2'-0" OR LESS



UPSTREAM HEADWALL REINFORCEMENT NEAR INTERIOR WALL

NEAR MIDSPAN

UPSTREAM HEADWALL REINFORCEMENT



DOWNSTREAM HEADWALL REINFORCEMENT NEAR INTERIOR WALL

DOWNSTREAM HEADWALL REINFORCEMENT

GENERAL NOTES:

FOR MEMBER THICKNESS AND FOR BAR SIZES, SPACING AND DIMENSIONS OF ALL REINFORCEMENT EXCEPT J5 BARS, SEE 703.47. FOR J5 BARS, SEE 703.37.

BARREL AND WINGS SECTIONS ARE SYMMETRICAL ABOUT AND NORMAL TO © CULVERT. HEADWALL SECTIONS ARE NORMAL TO LONG DIRECTION OF HEADWALL.

DRAWING NOT TO SCALE. FOLLOW DIMENSIONS.

MINIMUM CLEARANCE TO REINFORCING STEEL SHALL BE 1 $\frac{1}{2}$.



MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)



CONCRETE DOUBLE BOX CULVERT

SKEW: RIGHT ADVANCE WINGS: STRAIGHT

SECTIONS

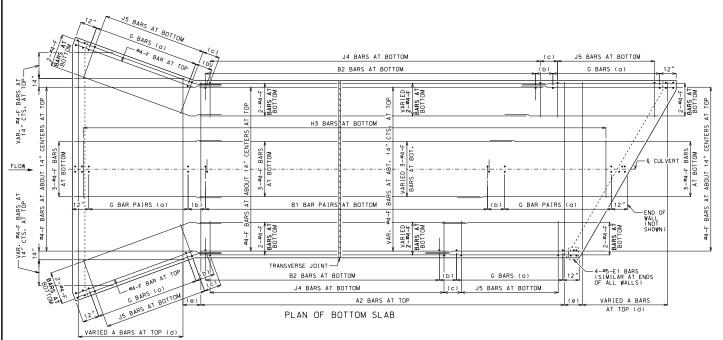
DATE EFFECTIVE: DATE PREPARED: 10/01/2011

703.44H

SHEET NO. 3 OF 3

(b) #8 FOR CLEAR SPAN > 10'-0" #9 FOR CLEAR SPAN > 13'-0" NOT REQUIRED FOR CLEAR SPANS ≤ 10'-0"

IF D2 BARS ARE REQUIRED. THE MINIMUM LENGTH EACH SIDE OF & WALL SHALL BE THE GREATER OF 48 BAR DIAMETERS OF 4 CLEAR SPAN. THE CLEAR SPAN IS PARALLEL TO LONG DIRECTION OF HEADWALL.



3'-0" J3 BARS AT FILL FACE A1 BARS #4-F BARS -#4-F BARS CONST. JT. CONST. JT. 2-#7-J6 BARS-2-#7-J1 BARS KEYED CONST. JT. - #4-F BAR AT FILL FACE FLOW -KEYED #4-F BAR CONST. JT. \(\text{AT F.F.} \) -VARIED #4-F BARS AT 14" CTS. AT STREAM FACE VARIED #4-F BARS #4-F BARS AT 14" CTS. AT S.F. 2-#5-E1 BARS AT 14" CTS. BEND LINE -KEYED CONST. JOINT -KEYED CONST. JT. #4-F BARS TRANS. JOINT -#4-F BARS #4-F BARS G BARS AT S.F. (a) B2 BARS AT STREAM FACE G BARS AT S.F. (a) J5 BARS AT FILL FACE J4 BARS AT FILL FACE (c) J5 BARS AT FILL FACE VARIED A BARS (SPACED A2 BARS AS SHOWN IN SLAB PLAN) DEVELOPED ELEVATION OF EXTERIOR WALL

J1 AND J6 BARS MAY BE BENT IN FIELD OR SHOP.

LAYING OUT TRANVERSE JOINTS

UNLESS SHOWN ON BRIDGE PLANS

USE A TRANSVERSE JOINT WHEN BARREL LENGTH IS OVER 80 FEET. USE ADDITIONAL JOINTS TO LIMIT CUT SECTION LENGTH AND END SECTION BARREL LENGTH MEASURED ALONG CENTERLINE OF CULVERT TO 50 FEET.

MINIMUM END SECTION LENGTH SHALL BE 3 FEET MEASURED ALONG THE SHORTEST WALL FROM THE INSIDE FACE OF HEADWALL TO THE TRANSVERSE JOINT.

TO AVOID LOCATING TRANSVERSE JOINTS UNDER A TRAVELED WAY WITH DESIGN FILLS 2 FEET OR LESS THE FOLLOWING SHALL APPLY:

BARREL LENGTH UP TO 90 FEET WITHOUT A TRANSVERSE JOINT

CUT SECTION LENGTHS UP TO 60 FEET

WHEN BARREL AND CUT SECTION LENGTH RESTRICTIONS REQUIRE TRANSVERSE JOINTS TO BE LOCATED UNDER A TRAVELED WAY WITH DESIGN FILLS 2 FEET OR LESS. THE JOINTS SHALL BE LOCATED TO MINIMIZE THE LENGTH OF JOINT UNDER THE TRAVELED WAY.

TRAVELED WAY IS THE ROADWAY WIDTH MINUS SHOULDER WIDTHS.

FOR CUT SECTION DETAILS, SEE 703.46.

GENERAL NOTES:

FOR SECTIONS THRU BARREL. WINGS AND HEADWALLS, SEE SHEET 3 OF 3. FOR BAR SIZES, SPACING AND DIMENSIONS OF ALL REINFORCEMENT EXCEPT JS BARS, SEE 703.47. FOR JS BARS, SEE 703.37.

CONSTRUCTION JOINT KEY NOT SHOWN FOR CLARITY IN PLAN AND ELEVATION, SEE SHEET 3 OF 3 FOR DETAILS.

DRAWING NOT TO SCALE. FOLLOW DIMENSIONS.

MINIMUM CLEARANCE TO REINFORCING STEEL SHALL BE 1 1/2".

LAP LONGITUDINAL BARS A MINIMUM OF 23" AT SPLICES.

BEVELED HEADWALL SHALL BE LOCATED AT UPSTREAM END.

- (a) SAME SIZE AND SPACING AS ADJACENT B BARS
- (b) VARIES. 12" MAXIMUM
- (c) J4 BAR SPACING
- (d) SAME SIZE AND SPACING AS A2 BARS
- (e) A2 BAR SPACING



MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)

CONCRETE DOUBLE BOX CULVERT



SKEW: RIGHT ADVANCE

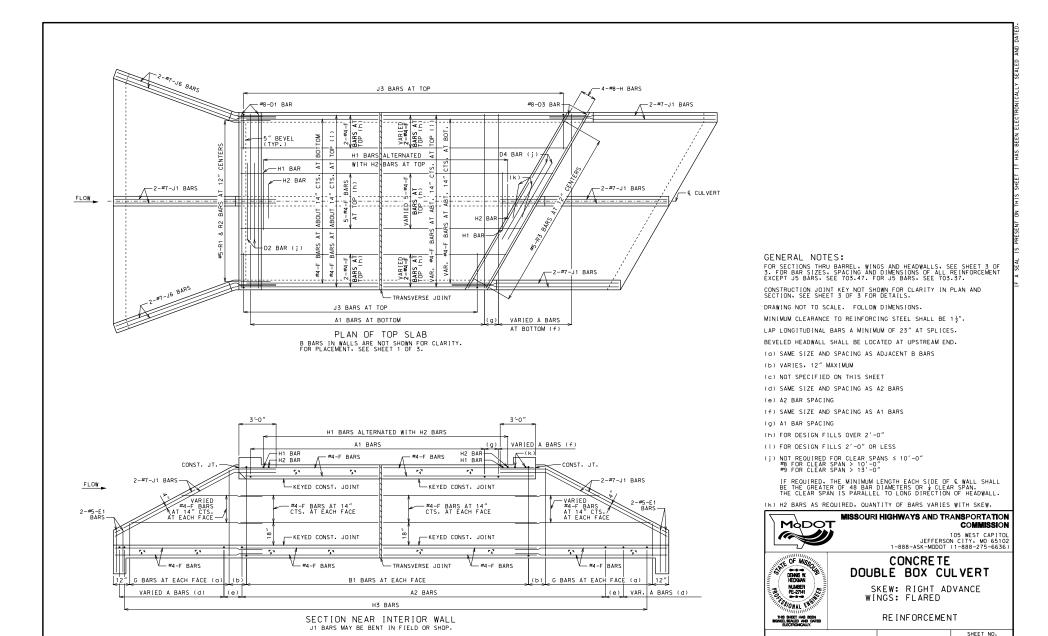
WINGS: FLARED

REINFORCEMENT

DATE EFFECTIVE: 10/01/2011 DATE PREPARED:

703.45C

SHEET NO. 1 OF 3



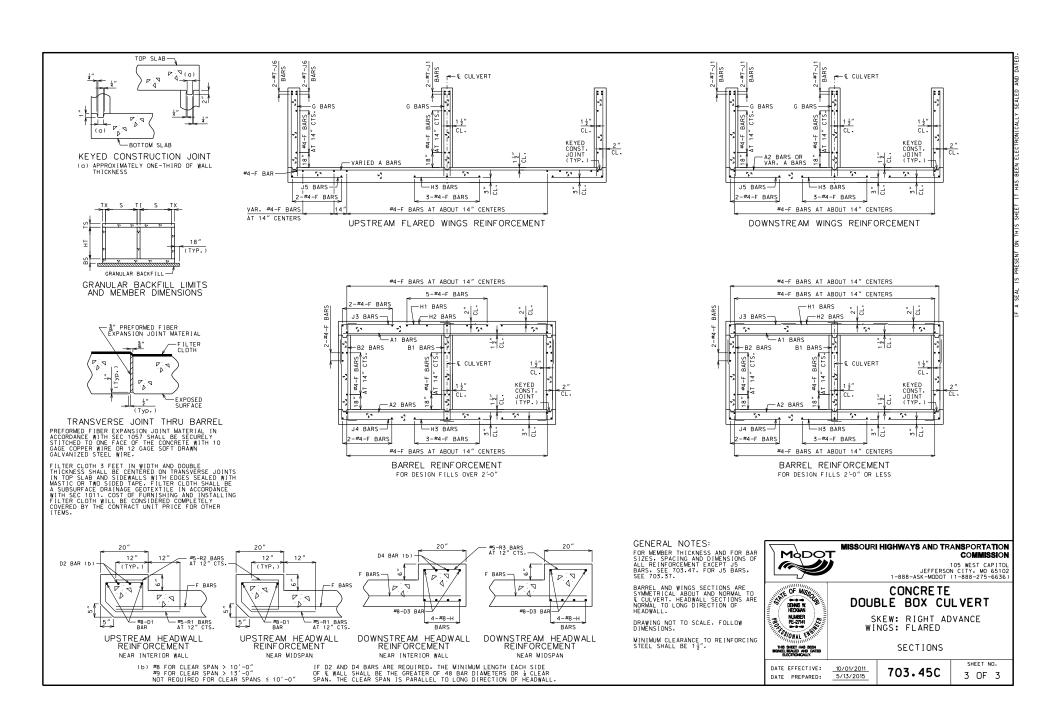
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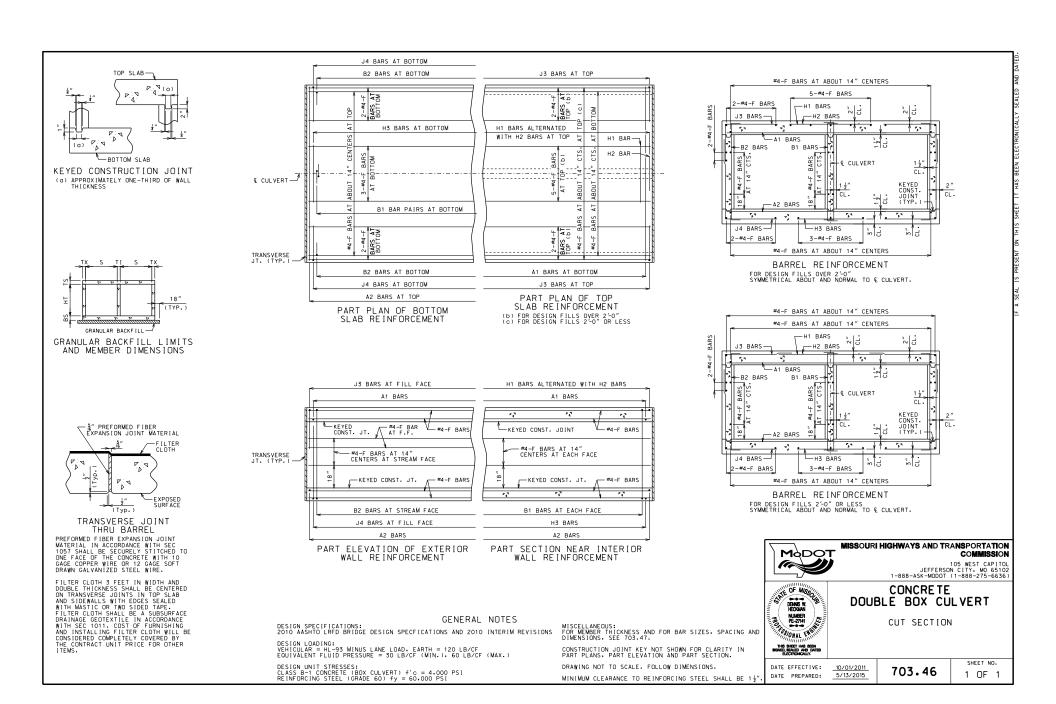
DATE PREPARED:

10/01/2011

703.45C

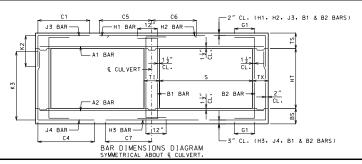
2 OF 3





										S	PAN (S) =	3 F	T		HE	I GH	Г (НТ) =	2 FT	OR	3 F		4 FT										
		MEM									TOP SL.	AB BAR	S										BOT1	roM SL/	AB BAR	S					WAL	L BAF		
DESIGN	1	THICK	NES:	S	A1	BARS			J3	BARS				H1 B/	RS		H2 BA	RS.	A2	BARS			J4	BARS			ŀ	нз ва	RS	B1 E	BARS	B2	BARS	
FILL	TS	BS	ТX	ΤI	SIZE	SPA.	SIZE	SPA.	C1	HT=2'	K2 HT=3'	HT=4′	SIZE	SPA.	C5	SIZE	SPA.	C6	SIZE	SPA.	SIZE	SPA.	C4	HT=2'	K3 HT=3'	HT=4'	SIZE	SPA.	C7	SIZE	SPA.	SIZE	SPA. G	31
1 FT	10	8	8	8	4	8.5	4	10.5	23.8	26.0	26.0	26.0	4	24	39.5	4	24	16.0	4	12	4	12	35.3	28	40	52	4	12	24.5	5	12	5	12 1	2
2 FT	10	8	8	8	4	9	4	10.5	23.8	26.0	26.0	26.0	4	24	39.5	4	24	16.0	4	12	4	12	33.0	28	40	52	4	12	24.5	5	12	5	12 1	2
4 FT	8	8	8	8	4	12	4	12	23.8	24.0	24.0	24.0	4	24	39.5	4	24	15.5	4	12	4	12	30.1	28	40	52	4	12	23.5	5	12	5	12 1	2
6 FT	8	8	8	8	4	12	4	12	30.0	24.0	24.0	24.0	4	24	24.5	4	24	15.0	4	12	4	12	28.0	28	40	52	4	12	23.0	5	12	5	12 1	2
8 FT	8	8	8	8	4	12	4	12	28.0	24.0	24.0	24.0	4	24	23.5	4	24	15.0	4	12	4	12	27.0	28	40	52	4	12	23.0	5	12	5	12 (ᆰ
10 FT	8	8	8	8	4	12	4	12	25.0	24.0	24.0	24.0	4	24	22.0	4	24	14.5	4	12	4	12	24.6	28	40	52	4	12	22.5	5	12	5	12 (ᆰ
12 FT	8	8	8	8	4	12	4	12	24.9	24.0	24.0	24.0	4	24	22.0	4	24	15.5	4	12	4	12	24.5	28	40	52	4	12	22.5	5	12	5	12 (ᇬ
14 FT	8	8	8	8	4	12	4	12	24.8	24.0	24.0	24.0	4	24	22.0	4	24	16.0	4	12	4	12	24.5	28	40	52	4	11.5	22.5	5	12	5	12 (ᆰ
16 FT	8	8	8	8	4	12	4	12	24.6	24.0	24.0	24.0	4	24	22.0	4	24	17.0	4	12	4	12	24.4	28	40	52	4	10.5	22.5	5	12	5	12 (ᆰ
18 FT	8	8	8	8	4	12	4	12	24.6	24.0	24.0	24.0	4	24	22.0	4	24	17.5	4	12	4	12	24.4	28	40	52	4	10	22.5	5	12	5	12 (٥
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24 FT	8	8	8	8	4	12	4	12	24.5	24.0	24.0	24.0	4	24	22.0	4	24	18.0	4	12	4	12	24.3	28	40	52	4	8.5	22.5	5	12	5	12 (0
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										SP	AN (S	;) =	3 F	T		H	EIGHT	(H	T) =	5 F	T OF	6 F	T									
		MEM									SLAB I										E		SLAB B	BARS						L BAI		
DESIGN		THIC	CNESS	3	A1	BARS			J3 BA	RS			H1 B4	RS.		H2 BA	RS.	A2	BARS			J4 BA	RS			нз вы	RS	B1 I	BARS	B2	2 BARS	5
FILL	TS	BS	тх	ΤI	SIZE	SPA.	SIZE	SPA.	C1	HT=5'	2 HT=6'	SIZE	SPA.	C5	SIZE	SPA.	C6	SIZE	SPA.	SIZE	SPA.	C4	HT=5′		SIZE	SPA.	C7	SIZE	SPA.	SIZE	SPA.	G1
1 FT	10	8	8	8	4	8.5	4	10.5	23.8	26.0	26.0	4	24	39.5	4	24	16.0	4	12	4	11.5	39.0	64	76	4	12	24.5	5	12	5	12	12
2 FT	10	8	8	8	4	8.5	4	10.5	23.8	26.0	26.0	4	24	39.5	4	24	16.0	4	12	4	11	39.9	64	76	4	11.5	24.5	5	12	5	12	12
4 FT	8	8	8	8	4	12	4	12	23.8	24.0	24.0	4	24	39.5	4	24	15.0	4	12	4	10	38.6	64	76	4	12	23.5	5	12	5	12	12
6 FT	8	8	8	8	4	12	4	12	36.9	24.0	24.0	4	24	25.0	4	24	14.5	4	12	4	9.5	36.9	64	76	4	12	23.0	5	12	5	12	12
8 FT	8	8	8	8	4	12	4	12	38.6	24.0	24.0	4	24	23.5	4	24	15.0	4	12	4	9	35.8	64	76	4	12	23.0	5	12	5	12	0
10 FT	8	8	8	8	4	12	4	12	33.1	24.0	24.0	4	24	21.5	4	24	14.0	4	12	4	9.5	32.8	64	76	4	12	22.5	5	12	5	12	0
12 FT	8	8	8	8	4	12	4	12	32.8	24.0	24.0	4	24	21.5	4	24	15.0	4	12	4	9	32.5	64	76	4	12	22.5	5	12	5	12	0
14 FT	8	8	8	8	4	12	4	11	32.4	24.0	24.0	4	24	21.5	4	24	16.0	4	12	4	8.5	32.3	64	76	4	12	22.5	5	12	5	12	0
16 FT	8	8	8	8	4	12	4	10	32.1	24.0	24.0	4	24	21.5	4	24	16.5	4	12	4	8	32.1	64	76	4	11.5	22.5	5	12	5	12	0
18 FT	8	8	8	8	4	12	4	9	32.0	24.0	24.0	4	24	21.5	4	24	17.0	4	12	4	7.5	32.0	64	76	4	11	22.5	5	12	5	12	0
20 FT	8	8	8	8	4	12	4	8	31.8	24.0	24.0	4	24	21.5	4	24	17.0	4	12	4	7	31.9	64	76	4	10	22.5	5	12	5	12	0
22 FT	8	8	8	8	4	12	4	7.5	31.6	24.0	24.0	4	24	21.5	4	24	17.5	4	12	4	6.5	31.8	64	76	4	9.5	22.5	5	12	5	12	0
24 FT	8	8	8	8	4	12	4	7	31.6	24.0	24.0	4	24	21.5	4	24	17.5	4	12	4	6	31.6	64	76	4	9.5	22.5	5	12	5	12	0
26 FT	8	8	8	8	4	12	4	6.5	31.5	24.0	24.0	4	24	21.5	4	24	17.5	4	11.5	5	6.5	31.6	64	76	4	9	22.5	5	12	5	12	0
28 FT	8	8	8	8	4	12	4	6	31.5	24.0	24.0	4	24	21.5	4	24	17.5	4	10.5	5	6	31.5	64	76	4	8.5	22.5	5	12	5	12	0
30 FT	8	9	8	8	4	12	5	6.5	31.3	24.0	28.0	4	24	21.5	4	24	17.5	4	11.5	5	6.5	32.8	65	77	4	10	22.5	5	12	-	11.5	0
32 FT	8	9	8	8	4	11	5	6	31.3	24.0	28.0	4	24	21.5	4	24	17.5	4	11	5	6	32.6	65	77	4	9.5	22.5	5	12	5	11	0
34 FT	8	9	8	8	4	10.5	5	6	31.3	24.0	28.0	4	23	21.5	4	23	17.5	4	10	5	6	32.6	65	77	4	9	22.5	5	12	5	10.5	0
36 FT	8	10	8	8	4	10	6	7.5	34.1	24.0	28.0	4	22	21.5	4	22	17.5	4	11	5	6	33.5	66	78	4	10.5		5	12	5	10	0
38 FT	8	10	8	8	4	9.5	6	7.5	34.1	24.0	28.0	4	21	21.5	4	21	17.5	4	10.5	5	6	33.5	66	78	4	10	22.5	5	12	5	9.5	0
40 FT	1 9	10	8	8	4	10	5	6	31.9	25.0	29.0	4	24	21.0	4	24	17.5	1 4	10	6	7	36.4	66	78	4	9.5	22.5	5	12	5	9.5	0
42 FT	9	10	8	8	4	9.5	5	6	31.9	25.0	29.0	4	23	21.0	4	23	17.5	4	9.5	6	1 7	36.3	66	78	4	9	22.5	5	12	5	9.5	0
44 FT	9	10	8	8	4	9	6	7	34.9	25.0	33.0	4	22	21.0	4	22	17.5	4	9	6	6.5	36.3	66	78	4	8.5	22.5	5	12	5	9.5	0
46 FT	10		8	8	4	9.5	5	6	32.8	26.0	30.0	4	24	20.5	4	24	17.0	4	10	6	1 7	36.9	67	79	4	9.5	22.5	5	12	5	9.5	0
48 FT	10		8	8	4	9	6	7	35.8	26.0	34.0	4	24	20.5	4	24	17.5	4	9.5	6	6.5	36.9	67	79	4	9	22.5	5	12	5	9.5	0
50 FT	10	11	8	- 8	4	8.5	<u> </u> 6	7	35.6	26.0	34.0	4	24	20.5	_ 4	24	17.5	_ 4	<u> </u>	6	6.5	36.9	67	79	_ 4	9	22.5	5	12	5	9.5	. 0



SPECIAL DESIGNS ARE REQUIRED WHEN THE DESIGN FILL IS LESS THAN 1 FOOT OR GREATER THAN 50 FEET.

DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.

DESIGN FILLS ARE MEASURED FROM THE TOP OF TOP SLAB TO THE TOP OF EARTH FILL OR ROADWAY.

CULVERTS MEET STRENGTH AND SERVICEABILITY REQUIREMENTS FOR THE DESIGN VEHICULAR LIVE LOAD HL-93 MINUS THE LANE LOAD.



MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)



CONCRETE DOUBLE BOX CULVERT

MEMBER THICKNESS BAR SIZE, SPACING & DIMENSIONS

SPAN (S): 3 FEET HEIGHT (HT): 2 THRU 6 FEET

DATE EFFECTIVE: DATE PREPARED:

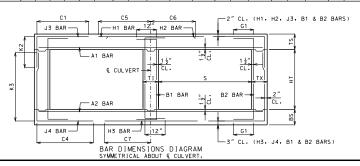
9/8/2011

703.47

SHEET NO. 1 OF 27

										SP	AN (S) =	4 F	T		H	IGHT	(H)	() =	2 F	T OR	3 F1										
		MEM									SLAB										Е	BOTTOM		BARS					WAL			
DESIGN		THICK	NE S	5	A1	BARS			J3 BA				H1 BA	RS		H2 BA	RS	A2	BARS			J4 BA				нз ва	RS	B1 I	BARS	B2	BAR	ś
FILL	TS	BS	ТX	ΤI	SIZE	SPA.	SIZE	SPA.	C1	HT=2'	2 HT=3'	SIZE	SPA.	C5	SIZE	SPA.	C6	SIZE	SPA.	SIZE	SPA.	C4	HT=2'		SIZE	SPA.	C7	SIZE	SPA.	SIZE	SPA.	G1
1 FT	10	8	8	8	4	7	4	10.5	27.3	26.0	26.0	4	23	48.0	4	23	20.5	4	12	4	12	29.3	28	40	4	9.5	28.0	5	12	5	12	12
2 FT	10	8	8	8	4	7	4	10.5	27.3	26.0	26.0	4	23	48.0	4	23	20.0	4	12	4	12	27.3	28	40	4	9	27.5	5	12	5	12	12
4 FT	8	8	8	8	4	12	4	12	26.3	24.0	24.0	4	24	34.0	4	24	19.0	4	12	4	12	25.0	28	40	4	9.5	27.0	5	12	5	12	12
6 FT	8	8	8	8	4	12	4	12	24.8	24.0	24.0	4	24	28.5	4	24	19.0	4	12	4	12	24.0	28	40	4	9.5	26.5	5	12	5	12	12
8 FT	8	8	8	8	4	12	4	12	24.1	24.0	24.0	4	24	27.0	4	24	19.0	4	12	4	12	23.4	28	40	4	9	26.0	5	12	5	12	0
10 FT	8	8	8	8	4	12	4	12	22.6	24.0	24.0	4	24	25.5	4	24	18.5	4	12	4	12	22.1	28	40	4	9	25.5	5	12	5	12	0
12 FT	8	8	8	8	4	12	4	12	22.5	24.0	24.0	4	24	25.5	4	24	18.5	4	12	4	12	22.1	28	40	4	8	25.5	5	12	5	12	0
14 FT	8	8	8	8	4	12	4	12	22.5	24.0	24.0	4	22	25.5	4	22	18.5	4	12	4	12	22.1	28	40	4	7.5	25.5	5	12	5	12	0
16 FT	8	8	8	8	4	12	4	12	22.5	24.0	24.0	4	20	25.5	4	20	18.5	4	11	4	12	22.1	28	40	4	7	25.5	5	12	5	12	0
18 FT	8	8	8	8	4	12	4	12	22.5	24.0	24.0	4	18	25.5	4	18	18.5	4	10	4	11.5	22.0	28	40	4	6.5	25.5	5	12	5	12	0
20 FT	8	8	8	8	4	10.5	4	11.5	22.5	24.0	24.0	4	17	25.5	4	17	18.5	4	9	4	10.5	22.0	28	40	4	6	25.5	5	12	5	12	0
22 FT	8	9	8	8	4	10	4	10.5	22.6	24.0	24.0	4	15	25.5	4	15	18.5	4	9	4	12	21.4	29	41	4	6.5	26.0	5	12	5	12	0
24 FT	8	9	8	8	4	9	4	9.5	22.6	24.0	24.0	4	14	25.5	4	14	18.5	4	8.5	4	12	21.4	29	41	4	6	26.0	5	12	5	12	0
26 FT	8	10	8	8	4	8.5	4	8.5	22.8	24.0	24.0	4	13	25.5	4	13	18.5	4	8.5	4	12	20.9	30	42	4	6.5	26.0	5	12	5	12	0
28 FT	8	10	8	8	4	7.5	4	8	22.8	24.0	24.0	4	12	25.5	4	12	18.5	4	8	4	12	20.9	30	42	4	6.5	26.0	5	12	5	12	0
30 FT	9	10	8	8	4	8	4	10.5	22.3	25.0	25.0	4	13	25.5	4	13	18.5	4	7.5	4	12	21.0	30	42	4	6	26.0	5	12	5	12	0
32 FT	10	11	8	8	4	7.5	4	10	22.4	25.0	25.0	4	12	25.5	4	12	18.5	4	8	4	10.5	20.6	31	43	4	6.5	26.0	5	12	5	12	0
34 FT		11	8	8		7.5	4	10.5	22.0	26.0	26.0	4	13	25.0	4	13	18.5	4	7.5	4	10.5	20.9	31 32	43	4	6.5	26.0	5	12	5	12	0
36 FT 38 FT	10	12	8	8	4	7	4	9.5	22.1	26.0	26.0	4	12	25.0	4	12	18.5	4	7.5	4	9.5	20.6	32	44	4	6	26.0	5	12	5	12	0
40 FT	11	12	8	8	4	7	4	9.5	21.8	27.0	27.0	4	13	25.0	4	13	18.5	4	7.5	4	9.5	20.9	32	44	4	6	26.0	5	12	5	12	0
42 FT	11	13	0	8	4	6.5	7	9.5	21.9	27.0	27.0	4	12	25.0	4	12	18.5	4	7	4	8.5	20.6	33	45	4	6	26.0	5	12	5	12	0
42 FT	11	13	8	8	4	6.5	+ 4	9.5	21.9	27.0	27.0	4	12	25.0	4	12	18.5	4	7	4	8.5	20.6	33	45	4	6	26.0	5	12	5	12	0
46 FT	12	13	8	8	4	6.5	1 4	8.5	21.6	28.0	28.0	4	12	24.5	4	12	18.5	4	6.5	4	8.5	20.9	33	45	5	8.5	26.0	5	12	5	12	0
48 FT	12	13	8	8	4	6.5	1 4	8.5	21.6	28.0	28.0	4	12	24.5	4	12	18.5	4	6	4	8.5	20.9	33	45	5	8.5	26.0	5	12	5	12	0
50 FT	12	14	8	8	4	6	1 4	8.5	21.8	28.0	28.0	4	12	24.5	4	12	18.5	4	6.5	4	7.5	20.8	34	46	5	9	26.0	5	12	5	12	ŏ
		1.4						10.0				<u> </u>		2 3				<u> </u>	575	<u>'</u>		20.0					20.0					Ľ

											AN (S		4 F	T		H	EIGHT	(H	Γ) =	4 F												
		MEM	BER							TOP	SLAB	BARS									E	BOTTOM	SLAB I	BARS					WAL	L BA	RS	
DESIGN		THIC	NESS	5	A1	BARS			J3 B4	RS			H1 BA	RS		H2 BA	.RS	A2	BARS			J4 BA	RS			нз ва	RS	B1 f	BARS	B2	2 BARS	ŝ
FILL	TS	BS	тх	ΤI	SIZE	SPA.	SIZE	SPA.	C1		2 HT=5'	SIZE	SPA.	C5	SIZE	SPA.	C6	SIZE	SPA.	SIZE	SPA.	C4	HT=4	3 HT=5'	SIZE	SPA.	C7	SIZE	SPA.	SIZE	SPA.	G1
1 FT	10	8	8	8	4	7	4	10.5	27.3	26.0	26.0	4	23	48.0	4	23	20.5	4	12	4	12	39.9	52	64	4	9	28.0	5	12	5	12	12
2 FT	10	8	8	8	4	7	4	10.5	27.3	26.0	26.0	4	23	48.0	4	23	20.5	4	12	4	12	36.8	52	64	4	9	27.5	5	12	5	12	12
4 FT	8	8	8	8	4	12	4	12	27.3	24.0	24.0	4	24	48.0	4	24	19.5	4	12	4	12	33.8	52	64	4	9	27.0	5	12	5	12	12
6 FT	8	8	8	8	4	12	4	12	33.5	24.0	24.0	4	24	28.5	4	24	19.0	4	12	4	11.5	31.3	52	64	4	9	26.5	5	12	5	12	12
8 FT	8	8	8	8	4	12	4	12	30.6	24.0	24.0	4	24	27.0	4	24	19.0	4	12	4	11	29.9	52	64	4	8.5	26.0	5	12	5	12	0
10 FT	8	8	8	8	4	12	4	12	27.4	24.0	24.0	4	24	25.5	4	24	18.5	4	12	4	12	27.1	52	64	4	9	25.5	5	12	5	12	0
12 FT	8	8	8	8	4	12	4	12	27.1	24.0	24.0	4	24	25.5	4	24	18.5	4	12	4	11	26.9	52	64	4	8	25.5	5	12	5	12	0
14 FT	8	8	8	8	4	12	4	12	27.0	24.0	24.0	4	22	25.0	4	22	18.5	4	12	4	10.5	26.8	52	64	4	7.5	25.5	5	12	5	12	0
16 FT	8	8	8	8	4	12	4	11	26.9	24.0	24.0	4	21	25.0	4	21	18.5	4	10.5	4	10	26.6	52	64	4	7	25.5	5	12	5	12	0
18 FT	8	8	8	8	4	11.5	4	10	26.8	24.0	24.0	4	19	25.0	4	19	18.5	4	9.5	4	9	26.6	52	64	4	6.5	25.5	5	12	5	12	0
20 FT	8	8	8	8	4	10.5	4	9	26.6	24.0	24.0	4	17	25.0	4	17	18.5	4	8.5	4	8	26.5	52	64	4	6	25.5	5	12	5	12	0
22 FT	8	9	8	8	4	9.5	4	8	26.8	24.0	24.0	4	15	25.0	4	15	18.5	4	9	4	9.5	26.8	53	65	4	6.5	26.0	5	12	5	12	0
24 FT	8	9	8	8	4	9	4	7.5	26.6	24.0	24.0	4	14	25.0	4	14	18.5	4	8.5	4	9	26.6	53	65	4	6.5	26.0	5	12	5	12	0
26 FT	8	10	8	8	4	8.5	4	6.5	26.6	24.0	24.0	4	13	25.0	4	13	18.5	4	8.5	4	10.5	26.9	54	66	4	7	26.0	5	12	5	12	0
28 FT	8	10	8	8	4	7.5	4	6	26.6	24.0	24.0	4	12	25.0	4	12	18.5	4	8	4	10	26.9	54	66	4	6.5	26.0	5	12	5	12	0
30 FT	9	10	8	8	4	8	4	7.5	26.8	25.0	25.0	4	13	25.0	4	13	18.5	4	7	4	9	26.9	54	66	4	6	26.0	5	12	5	12	0
32 FT	9	11	8	8	4	7.5	4	6.5	26.9	25.0	25.0	4	12	25.0	4	12	18.5	4	8	4	9	27.1	55	67	4	6.5	26.0	5	12	5	12	0
34 FT	10	11	8	8	4	7.5	4	6.5	27.0	26.0	26.0	4	14	24.5	4	14	18.5	4	7.5	4	8.5	27.1	55	67	4	6	26.0	5	12	5	12	0
36 FT	10	12	8	8	4	7.5	4	6.5	27.1	26.0	26.0	4	13	24.5	4	13	18.5	4	8	4	8.5	27.4	56	68	4	6.5	26.0	5	12	5	12	0
38 FT	10	12	8	8	4	7	4	6	27.1	26.0	26.0	4	12	24.5	4	12	18.5	4	7.5	4	8	27.4	56	68	4	6	26.0	5	12	5	12	0
40 FT	11	12	8	8	4	7	4	6	27.3	27.0	27.0	4	14	24.5	4	14	18.5	4	7	4	7.5	27.5	56	68	4	6	26.0	5	12	5	12	0
42 FT	11	13	8	8	4	7	5	9	27.3	27.0	27.0	4	13	24.5	4	13	18.5	4	7.5	4	7.5	27.8	57	69	4	6	26.0	5	12	5	12	0
44 FT	11	13	8	8	4	6.5	5	8.5	27.3	27.0	27.0	4	12	24.5	4	12	18.5	4	1 7	4	7.5	27.6	57	69	4	6	26.0	5	12	5	12	0
46 FT	11	13	8	8	4	6	5	8.5	27.3	27.0	27.0	4	12	24.5	4	12	18.5	4	6.5	4	1 7	27.6	57	69	5	9	26.0	5	12	5	12	0
48 FT	12	13	8	8	4	6.5	5	8.5	27.4	28.0	28.0	4	13	24.0	4	13	18.5	4	6.5	4	6.5	27.8	57	69	5	8.5	26.0	5	12	5	11.5	U
50 FT	12	14	8	8	4	6	5	8.5	27.5	28.0	28.0	4	13	23.5	4	13	18.0	4	_ 7	4	6.5	28.0	58	70	_ 4	6	25.5	5	12	5	11	Ü



IF DESIGN FILL IS BETWEEN TABULATED DESIGN FILLS. USE THE NEXT GREATER TABULATED DESIGN FILL, EXCEPT FOR DESIGN FILLS BETWEEN 2 FEET AND 4 FEET. FOR DESIGN FILLS BETWEEN 2 FEET AND 4 FEET SET THE GREATER MEMBER THICKNESS. AREA OF REINFORCEMENT AND BAR DIMENSIONS FROM THE 2 FEET AND 4 FEET TABULATED DESIGN FILLS. AREA OF REINFORCEMENT EDUALS BAR AREA PER FOOT SPACING.

SPECIAL DESIGNS ARE REQUIRED WHEN THE DESIGN FILL IS LESS THAN 1 FOOT OR GREATER THAN 50 FEET.

DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.

DESIGN FILLS ARE MEASURED FROM THE TOP OF TOP SLAB TO THE TOP OF EARTH FILL OR ROADWAY.

CULVERTS MEET STRENGTH AND SERVICEABILITY REQUIREMENTS FOR THE DESIGN VEHICULAR LIVE LOAD HL-93 MINUS THE LANE LOAD.



MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)



CONCRETE DOUBLE BOX CULVERT

MEMBER THICKNESS BAR SIZE, SPACING & DIMENSIONS

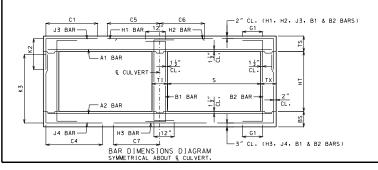
SPAN (S): 4 FEET HEIGHT (HT): 2 THRU 5 FEET

DATE EFFECTIVE: DATE PREPARED: 9/8/2011

703.47

SHEET NO. 2 OF 27

											AN (S		4 F	T		H8	IGHT	(H	Γ) =	6 F											
	١.	MEM									SLAB	_									E	BOTTOM		BARS					WAL		
DESIGN		THICK	NE SS	•	A1	BARS			J3 BA				H1 BA	RS		H2 BA	RS	A2	BARS			J4 BA				нз ва	RS	B1	BARS	B2	BARS
FILL	TS	BS	ТX	ΤĮ	SIZE	SPA.	SIZE	SPA.	C1		2 HT=7'	SIZE	SPA.	C5	SIZE	SPA.	C6	SIZE	SPA.	SIZE	SPA.	C4	HT=6'		SIZE	SPA.	C7	SIZE	SPA.	SIZE	SPA. G1
1 FT	10	8	8	8	4	6.5	4	10.5	27.3	26.0	26.0	4	24	48.0	4	24	20.5	4	12	4	8.5	46.6	76	88	4	8.5	28.0	5	12	5	12 12
2 FT	10	8	8	8	4	6.5	4	10.5	27.3	26.0	26.0	4	23	48.0	4	23	20.5	4	12	4	8.5	45.3	76	88	4	8.5	27.5	5	12	5	12 12
4 FT	8	8	8	8	4	12	4	10.5	27.3	24.0	24.0	4	24	48.0	4	24	19.5	4	12	4	7.5	43.0	76	88	4	9	27.0	5	12	5	12 12
6 FT	8	8	8	8	4	12	4	10	47.3	24.0	24.0	4	24	28.5	4	24	19.0	4	12	4	7	40.8	76	88	4	9	26.5	5	12	5	12 12
8 FT	8	8	8	8	4	12	4	9	41.4	24.0	24.0	4	24	27.0	4	24	19.0	4	12	4	6.5	39.0	76	88	4	8.5	26.0	5	12	5	12 0
10 FT	8	8	8	8	4	12	4	10	35.4	24.0	24.0	4	24	25.0	4	24	18.5	4	12	4	7	35.1	76	88	4	8.5	25.5	5	12	5	12 0
12 FT	8	8	8	8	4	12	4	8.5	34.9	24.0	24.0	4	24	25.0	4	24	18.5	4	12	4	6.5	34.9	76	88	4	8	25.5	5	12	5	12 0
14 FT	8	8	8	8	4	12	4	7.5	34.6	24.0	24.0	4	23	25.0	4	23	18.5	4	12	4	6	34.6	76	88	4	7.5	25.5	5	12	5	12 0
16 FT	8	8	8	8	4	12	4	6.5	34.4	24.0	24.0	4	22	25.0	4	22	18.5	4	10.5	5	6.5	34.4	76	88	4	7	25.5	5	12	5	12 0
18 FT	8	8	8	8	4	12	4	6	34.1	24.0	24.0	4	19	25.0	4	19	18.5	4	9.5	5	6	34.3	76	88	4	6.5	25.5	5	12	5	12 0
20 FT	8	9	9	8	4	11	4	6.5	33.6	24.0	24.0	4	18	24.5	4	18	18.5	4	10	4	6.5	34.9	77	89	4	7.5	25.5	5	12	5	12 0
22 FT	8	9	9	8	4	10	4	6	33.5	24.0	24.0	4	16	25.0	4	16	18.5	4	9	4	6	34.8	77	89	4	7	25.5	5	12	5	12 0
24 FT	8	9	9	8	4	9	5	6.5	33.4	24.0	28.0	4	15	25.0	4	15	18.5	4	8.5	5	7	34.6	77	89	4	6.5	25.5	5	12	5	12 0
26 FT	8	10	9	8	4	8.5	5	6	33.1	24.0	24.0	4	14	24.5	4	14	18.5	4	9	4	6	35.5	78	90	4	7	26.0	5	12	5	11.5 0
28 FT	8	10	9	8	4	8	6	7.5	36.1	24.0	28.0	4	13	24.5	4	13	18.5	4	8.5	5	7	35.5	78	90	4	6.5	26.0	5	12	5	10.5 0
30 FT	9	10	9	8	4	8	5	6	34.0	25.0	29.0	4	14	24.5	4	14	18.5	4	7.5	5	6.5	35.3	78	90	4	6	25.5	5	12	5	10 0
32 FT	9	11	9	8	4	8	5	6	33.9	25.0	29.0	4	13	24.5	4	13	18.5	4	8	5	6.5	35.9	79	91	4	6.5	26.0	5	12	5	9.5 0
34 FT	9	11	9	8	4	7.5	5	6	33.9	25.0	29.0	4	13	24.5	4	13	18.5	4	7.5	5	6.5	35.9	79	91	4	6	26.0	5	12	5	9 0
36 FT	10	11	9	8	4	7.5	5	6.5	34.6	26.0	30.0	4	14	24.0	4	14	18.0	4	7	5	6	35.8	79	91	4	6	25.5	5	12	5	8.5 0
38 FT	10	12	9	8	4	7	5	6	34.5	26.0	30.0	4	14	24.0	4	14	18.0	4	7.5	5	6	36.3	80	92	4	6	25.5	5	12	5	8.5 0
40 FT	10	12	9	8	4	7	5	6	34.5	26.0	30.0	4	13	24.0	4	13	18.0	4	7.5	5	6	36.3	80	92	4	6	25.5	5	12	5	8.5 0
42 FT	11	12	9	8	4	7	5	6	35.1	31.0	31.0	4	14	23.5	4	14	18.0	4	6.5	6	7.5	39.1	80	92	5	9	25.5	5	12	5	8.5 0
44 FT	11	13	10	8	4	6.5	5	1 7	35.1	27.0	31.0	4	14	23.0	4	14	18.0	4	7.5	5	7.5	36.8	81	93	4	6	25.5	5	12	5	8 0
46 FT	11	13	10	8	4	6.5	5	6.5	35.0	27.0	31.0	4	13	23.0	4	13	18.0	4	7	5	7	36.8	81	93	5	9	26.0	5	12	5	8 0
48 FT	11	13	10	8	4	6	5	6	35.0	27.0	31.0	4	13	23.0	4	13	18.0	4	6.5	5	6.5	36.8	81	93	5	8.5	25.5	5	12	5	8 0
50 FT	12	14	11	8	4	6.5	5	1 7	35.6	28.0	32.0	4	15	23.0	4	15	18.0	4	7	5	7.5	37.3	82	94	5	9	26.0	5	12	5	8 0



SPECIAL DESIGNS ARE REQUIRED WHEN THE DESIGN FILL IS LESS THAN 1 FOOT OR GREATER THAN 50 FEET.

DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.

DESIGN FILLS ARE MEASURED FROM THE TOP OF TOP SLAB TO THE TOP OF EARTH FILL OR ROADWAY.

CULVERTS MEET STRENGTH AND SERVICEABILITY REQUIREMENTS FOR THE DESIGN VEHICULAR LIVE LOAD HL-93 MINUS THE LANE LOAD.



MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)

CONCRETE



DOUBLE BOX CULVERT

MEMBER THICKNESS BAR SIZE, SPACING & DIMENSIONS

SPAN (S): 4 FEET HEIGHT (HT): 6 THRU 7 FEET

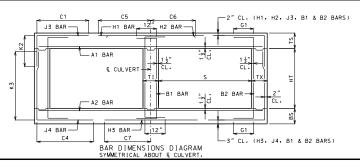
DATE EFFECTIVE: DATE PREPARED: 9/8/2011

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SHEET NO. 3 OF 27

											AN (S		5 F	T		H(EIGHT	(H)) =	3 F												
	١.	MEM	BER	_							SLAB	_									E	MOTTO		BARS					₩AL			
DESIGN		THICK	NE 5	5	A1	BARS			J3 BA				H1 BA	RS		H2 BA	RS	A2	BARS			J4 BA	_			нз ва	RS	B1 I	BARS	B2	BAR:	<u>ذ</u>
FILL	TS	BS	ТX	ΤI	SIZE	SPA.	SIZE	SPA.	C1	HT=3'	2 HT=4'	SIZE	SPA.	C5	SIZE	SPA.	C6	SIZE	SPA.	SIZE	SPA.	C4	HT=3'	3 HT=4'	SIZE	SPA.	C7	SIZE	SPA.	SIZE	SPA.	G1
1 FT	11	8	8	8	4	6.5	4	9.5	30.9	27.0	27.0	4	20	56.0	4	20	21.5	4	12	4	12	33.3	40	52	4	7.5	31.0	5	12	5	12	12
2 FT	11	8	8	8	4	6.5	4	9.5	30.9	27.0	27.0	4	19	56.0	4	19	21.5	4	11.5	4	11.5	31.0	40	52	4	7	31.0	5	12	5	12	12
4 FT	8	8	8	8	4	11	4	12	30.0	24.0	24.0	4	18	39.0	4	18	20.0	4	12	4	12	28.4	40	52	4	7	30.0	5	12	5	12	12
6 FT	8	8	8	8	4	12	4	12	27.4	24.0	24.0	4	19	32.0	4	19	20.0	4	11.5	4	12	26.9	40	52	4	7	29.5	5	12	5	12	12
8 FT	8	8	8	8	4	12	4	12	26.6	24.0	24.0	4	18	30.5	4	18	19.5	4	10.5	4	11.5	26.0	40	52	4	6.5	29.0	5	12	5	12	0
10 FT	8	8	8	8	4	11	4	12	26.1	24.0	24.0	4	16	29.5	4	16	19.5	4	9.5	4	10.5	25.5	40	52	4	6	29.0	5	12	5	12	0
12 FT	8	8	8	8	4	12	4	12	24.6	24.0	24.0	4	16	28.5	4	16	19.0	4	9.5	4	11	24.4	40	52	5	7.5	28.5	5	12	5	12	0
14 FT	8	8	8	8	4	10	4	11	24.6	24.0	24.0	4	14	28.5	4	14	19.0	4	8.5	4	10	24.3	40	52	5	7	28.5	5	12	5	12	0
16 FT	8	9	8	8	4	9	4	9.5	24.8	24.0	24.0	4	12	28.5	4	12	19.0	4	8.5	4	12	23.5	41	53	5	7.5	29.0	5	12	5	12	0
18 FT	8	9	8	8	4	8	4	8.5	24.8	24.0	24.0	5	17	28.5	5	17	19.5	4	7.5	4	11.5	23.5	41	53	5	7	29.0	5	12	5	12	С
20 FT	8	10	8	8	4	7.5	4	7.5	24.9	24.0	24.0	5	17	28.0	5	17	20.0	4	7.5	4	12	22.9	42	54	5	7.5	29.0	5	12	5	12	0
22 FT	9	10	8	8	4	7	4	9	24.3	25.0	25.0	5	16	28.5	5	16	19.0	4	7	4	12	23.1	42	54	5	7	29.0	5	12	5	12	0
24 FT	9	11	8	8	4	6.5	4	8	24.5	25.0	25.0	5	16	28.5	5	16	20.0	4	7	4	10.5	22.8	43	55	5	7.5	29.0	5	12	5	12	0
26 FT	10	11	8	8	4	6.5	4	8.5	24.0	26.0	26.0	5	16	28.5	5	16	19.0	4	6.5	4	10.5	23.0	43	55	5	7	29.0	5	12	5	12	С
28 FT	10	12	8	8	4	6.5	4	8	24.1	26.0	26.0	5	15	28.0	5	15	19.5	4	6.5	4	9.5	22.6	44	56	5	7.5	29.0	5	12	5	12	0
30 FT	11	12	8	8	4	6.5	4	8.5	23.8	27.0	27.0	5	15	28.0	5	15	19.0	4	6	4	9.5	22.9	44	56	5	7	29.0	5	12	5	12	0
32 FT	11	13	8	8	4	6	4	7.5	23.9	27.0	27.0	5	15	28.0	5	15	19.0	4	6.5	4	8.5	22.8	45	57	5	7.5	29.0	5	12	5	12	0
34 FT		13	8	8	4	6	4	8.5	23.6	28.0	28.0	5	15	28.0	5	15	19.0	4	6	4	8.5	22.9	45	57	5	7	29.0	5	12	5	12	0
36 FT	12	14	8	8	5	9	4	7.5	23.8	28.0	28.0	5	15	28.0	5	15	19.0	4	6	4	7.5	22.8	46	58	5	7.5	29.0	5	12	5	12	0
38 FT	13	14	8	8	5	9	4	7.5	23.5	29.0	29.0	5	15	27.5	5	15	19.0	4	6	4	7.5	23.0	46	58	5	7	29.0	5	12	5	12	0
40 FT	13	15	8	8	5	8.5	4	7.5	23.8	29.0	29.0	5	15	27.5	5	15	19.0	4	6	4	7	22.9	47	59	5	7.5	29.0	5	12	5	12	0
42 FT	13	15	8	8	5	8	4	7	23.8	29.0	29.0	5	14	27.5	5	14	19.0	5	9	4	7	22.9	47	59	5	7	29.0	5	12	5	12	0
44 FT		15	8	8	5	8.5	4	7	23.5	30.0	30.0	5	15	27.0	5	15	19.0	5	8.5	4	7	23.1	47	59	5	6.5	29.0	5	12	5	12	0
46 FT	14	16	8	8	5	8	4	1 7	23.6	30.0	30.0	5	14	27.0	5	14	19.0	5	9	4	6.5	23.1	48	60	5	7	29.0	5	12	5	12	0
48 FT	14	16	8	8	5	7.5	4	6.5	23.6	30.0	30.0	5	14	27.0	5	14	19.0	5	8.5	4	6.5	23.1	48	60	5	6.5	29.0	5	12	5	12	0
50 FT	15	16	8	8	5	7.5	4	6.5	25.6	31.0	31.0	5	15	31.5	5	15	24.0	5	8	4	6.5	23.3	48	60	5	6.5	29.0	5	12	5	12	0

										SP	AN (S	;) =	5 F	T		H8	EIGHT	(H.	T) =	5 F	T OF	? 6 F	Γ									
		MEM								TOP	SLAB	BARS									Е	воттом	SLAB I	BARS						L BA	RS	
DESIGN	1	THICE	NESS	5	A1	BARS			J3 B4	RS			H1 BA	RS.		H2 BA	RS.	A2	BARS			J4 BA	RS			нз ва	RS	B1	BARS	B2	2 BARS	S
FILL	TS	BS	ТX	ΤI	SIZE	SPA.	SIZE	SPA.	C1	HT=5'	2 HT=6'	SIZE	SPA.	C5	SIZE	SPA.	C6	SIZE	SPA.	SIZE	SPA.	C4		3 HT=6'	SIZE	SPA.	C7	SIZE	SPA.	SIZE	SPA.	G1
1 FT	11	8	8	8	4	6	4	9.5	30.9	27.0	27.0	4	20	56.0	4	20	22.0	4	11.5	4	9.5	44.1	64	76	4	7	31.0	5	12	5	12	12
2 FT	11	8	8	8	4	6	4	9.5	30.9	27.0	27.0	4	19	56.0	4	19	21.5	4	10.5	4	9	40.6	64	76	4	7	31.0	5	12	5	12	12
4 FT	8	8	8	8	4	10.5	4	10.5	30.9	24.0	24.0	4	18	56.0	4	18	20.0	4	11.5	4	9	37.6	64	76	4	7	30.0	5	12	5	12	12
6 FT	8	8	8	8	4	12	4	10.5	37.1	24.0	24.0	4	19	32.0	4	19	20.0	4	11	4	8.5	34.6	64	76	4	6.5	29.5	5	12	5	12	12
8 FT	8	8	8	8	4	12	4	10	33.8	24.0	24.0	4	18	30.5	4	18	19.5	4	10	4	8	33.0	64	76	4	6	29.0	5	12	5	12	0
10 FT	8	8	8	8	4	11	4	9	32.3	24.0	24.0	4	16	29.5	4	16	19.5	4	9	4	7.5	31.9	64	76	5	7.5	29.0	5	12	5	12	0
12 FT	8	8	8	8	4	11.5	4	9.5	29.5	24.0	24.0	4	16	28.5	4	16	19.0	4	9	4	7.5	29.4	64	76	5	7.5	28.5	5	12	5	12	0
14 FT	8	8	8	8	4	10	4	8	29.3	24.0	24.0	4	14	28.5	4	14	19.0	4	8	4	7	29.1	64	76	5	7	28.5	5	12	5	12	0
16 FT	8	9	8	8	4	9	4	7	29.3	24.0	24.0	4	12	28.0	4	12	19.0	4	8	4	8	29.3	65	77	5	7.5	29.0	5	12	5	12	0
18 FT	8	9	8	8	4	8	4	6.5	29.1	24.0	24.0	5	17	28.0	5	17	19.5	4	7	4	7.5	29.1	65	77	5	7	29.0	5	12	5	12	0
20 FT	8	10	8	8	4	7	5	7	29.0	24.0	24.0	5	17	28.0	5	17	20.0	4	7.5	4	8.5	29.3	66	78	5	7.5	29.0	5	12	5	12	0
22 FT	9	10	8	8	4	7	4	6.5	29.1	25.0	25.0	5	16	28.0	5	16	19.0	4	7	4	7.5	29.3	66	78	5	7	29.0	5	12	5	12	0
24 FT	9	11	8	8	4	6.5	4	6	29.1	25.0	25.0	5	16	28.0	5	16	19.5	4	7	4	7.5	29.5	67	79	5	7.5	29.0	5	12	5	12	0
26 FT	10	11	8	8	4	6.5	5	8	29.3	26.0	26.0	5	16	28.0	5	16	19.0	4	6.5	4	6.5	29.5	67	79	5	7.5	29.0	5	12	5	12	0
28 FT	10	12	8	8	4	6.5	5	7.5	29.3	26.0	26.0	5	15	28.0	5	15	19.0	4	6.5	4	6.5	29.6	68	80	5	7.5	29.0	5	12	5	12	0
30 FT	11	12	8	8	4	6.5	5	8.5	29.4	27.0	27.0	5	16	27.5	5	16	19.0	4	6.5	4	6	29.8	68	80	5	7.5	29.0	5	12	5	12	0
32 FT	11	13	8	8	4	6	5	8	29.5	27.0	27.0	5	15	27.5	5	15	19.0	4	6.5	4	6	29.9	69	81	5	7.5	29.0	5	12	5	12	0
34 FT	12	13	8	8	4	6	5	8.5	29.5	28.0	32.0	5	16	27.5	5	16	19.0	4	6	5	8.5	30.0	69	81	5	7	29.0	5	12	5	11.5	0
36 FT	12	_	8	8	5	9	5	7.5	29.6	28.0	32.0	5	15	27.0	5	15	19.0	4	6.5	5	9	30.1	70	82	5	7.5	29.0	5	12	5	10.5	0
38 FT	12	14	8	8	5	8.5	5	7.5	29.6	28.0	32.0	5	15	27.0	5	15	19.0	4	6	5	8.5	30.1	70	82	5	7	29.0	5	12	5	10	0
40 FT	13	14	8	8	5	8.5	5	7.5	29.6	29.0	33.0	5	16	27.0	5	16	19.0	5	8.5	5	8	30.3	70	82	5	7	29.0	5	12	5	9.5	Ļ٥
42 FT	13	15	8	8	5	8.5	5	1 7	29.8	29.0	33.0	5	15	26.5	5	15	19.0	4	6	5	8	30.4	71	83	5	7	28.5	5	12	5	9.5	0
44 FT	13	15	8	8	5	8	5	6.5	29.8	29.0	33.0	5	14	26.5	5	14	19.0	5	9	5	8	30.4	71	83	5	7	28.5	5	12	5	9.5	10
46 FT	14	16	9	8	5	8	5	8	30.5	30.0	34.0	5	16	26.0	5	16	19.0	5	9	5	9	31.0	72	84	5	7	29.0	5	12	5	9.5	0
48 FT	14	16	9	8	5	8	5	8	30.4	30.0	34.0	5	15	26.0	5	15	19.0	5	8.5	5	8.5	31.0	72	84	5	6.5	29.0	5	12	5	9	0
50 FT	14	16	10	8	5	7.5	5	7.5	31.0	30.0	30.0	5	15	26.0	5	15	19.0	5	8	4	6	31.1	72	84	5	6.5	29.0	5	12	5	10	0



SPECIAL DESIGNS ARE REQUIRED WHEN THE DESIGN FILL IS LESS THAN 1 FOOT OR GREATER THAN 50 FEET.

DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.

DESIGN FILLS ARE MEASURED FROM THE TOP OF TOP SLAB TO THE TOP OF EARTH FILL OR ROADWAY.

CULVERTS MEET STRENGTH AND SERVICEABILITY REQUIREMENTS FOR THE DESIGN VEHICULAR LIVE LOAD HL-93 MINUS THE LANE LOAD.



MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)



CONCRETE DOUBLE BOX CULVERT

MEMBER THICKNESS BAR SIZE, SPACING & DIMENSIONS

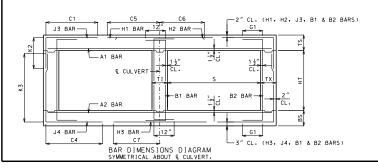
SPAN (S): 5 FEET HEIGHT (HT): 3 THRU 6 FEET

DATE EFFECTIVE: DATE PREPARED: 9/8/2011

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SHEET NO. 4 OF 27

												5) =	5 F	T		H(EIGHT	(H)	Γ) =	7 F											
		MEM	BER	_							SLAB	_									E	MOTTO		BARS				↓		L BA	
DESIGN		THICH	NESS	>	A1	BARS			J3 BA				H1 BA	RS		H2 BA	RS	A2	BARS			J4 BA				нз ва	RS	B1 I	BARS	B2	2 BARS
FILL	TS	BS	ТX	ΤI	SIZE	SPA.	SIZE	SPA.	C1	HT=7'	2 HT=8'	SIZE	SPA.	C5	SIZE	SPA.	C6	SIZE	SPA.	SIZE	SPA.	C4	HT=7'	3 HT=8'	SIZE	SPA.	C7	SIZE	SPA.	SIZE	SPA. G1
1 FT	11	8	8	8	4	6	4	9.5	30.9	27.0	27.0	4	20	56.0	4	20	22.0	4	10.5	4	7	52.1	88	100	4	7	31.0	5	12	5	12 12
2 FT	11	8	8	8	4	6	4	9	30.9	27.0	27.0	4	20	56.0	4	20	22.0	4	10	4	6.5	50.0	88	100	4	6.5	31.0	5	12	5	12 12
4 FT	8	8	8	8	4	10	4	7	30.9	24.0	24.0	4	18	56.0	4	18	20.5	4	10.5	4	6	47.4	88	100	4	6.5	30.0	5	12	5	12 12
6 FT	8	9	8	8	4	12	4	7	51.6	24.0	24.0	4	19	32.5	4	19	20.0	4	12	4	6.5	46.3	89	101	4	7.5	29.5	5	12	5	12 12
8 FT	8	9	8	8	4	12	4	6.5	44.5	24.0	24.0	4	18	30.5	4	18	19.5	4	11	4	6	44.0	89	101	4	7	29.5	5	12	5	12 0
10 FT	8	9	9	8	4	11.5	<u> </u>	7	40.8	24.0	24.0	4	16	29.5	4	16	19.5	4	10	4	6.5	41.4	89	101	4	6.5	29.0	5	12	5	12 0
12 FT	8	9	9	8	4	12	4	7	36.9	24.0	24.0	4	17	28.0	4	17	19.0	4	10.5	4	7	38.3	89	101	4	6.5	29.0	5	12	5	12 0
14 FT	8	9	9	8	4	10.5	4	6.5	36.4	24.0	24.0	4	15	28.0	4	15	19.0	4	9	4	6.5	37.9	89	101	4	6	29.0	5	12	5	12 0
16 FT	8	9	9	8	4	9	5	7	36.0	24.0	28.0	4	13	28.0	4	13	19.0	4	8	5	7	37.5	89	101	5	7.5	28.5	5	12	5	12 0
18 FT	8	9	9	8	4	8	5	6	35.8	24.0	28.0	5	18	28.0	5	18	19.0	4	7.5	5	6	37.3	89	101	5	7	28.5	5	12	5	12 0
20 FT	8	10	9	8	4	7.5	6	7	38.4	24.0	28.0	5	17	28.0	5	17	19.5	4	7.5	5	6.5	38.1	90	102	5	7.5	29.0	5	12	5	11 0
22 FT	9	10	9	8	4	7.5	5	6	36.4	25.0	29.0	5	17	27.5	5	17	19.0	4	7	5	6	37.8	90	102	5	7.5	29.0	5	12	5	10 0
24 FT	9	11	9	8	4	7	5	6	36.1	25.0	29.0	5	16	27.5	5	16	19.0	4	7	5	6	38.5	91	103	5	8	29.0	5	12	5	9.5 0
26 FT	10	11	9	8	4	7	5	6	36.9	26.0	30.0	5	17	27.5	5	17	19.0	4	6.5	5	6	38.3	91	103	5	7.5	29.0	5	12	5	9 0
28 FT	10	12	9	8	4	6.5	5	6	36.8	30.0	30.0	5	16	27.5	5	16	19.0	4	1 0 5	5	6	38.9	92	104	5	8	29.0	5	12	5	8.5 0
30 FT	11	12	9	8	4	6.5	5	6	37.4 40.3	31.0	31.0	5	17	27.0	5	17	19.0	4	6.5	5	7.5	41.6 39.1	92	104	5	7.5	29.0	5	12	5	8.5 0
32 FT 34 FT	11	13	9	8	4	6	6		40.3	31.0	35.0	5	15	27.0	5	15	19.0	4	6.5	6	- 6	42.1	93	105	5	7.5	29.0	5	12	5	8.5 0
36 FT	12	14	10	8	4	6	5	6.5	37.8	32.0	32.0	5	17	26.0	5	17	19.0	4	6.5	5	7	39.5	94	106	5	7.5	29.0	5	12	5	8 0
38 FT	12	14	10	8	5	9	5	6	37.6	32.0	32.0	5	16	26.0	5	16	19.0	4	6	5	6.5	39.5	94	106	5	7	29.0	5	12	5	8 0
40 FT	12	15	11	0	5	8.5	5	7	37.8	28.0	32.0	5	15	26.0	5	15	19.0	4	6	5	7	40.0	95	107	5	7.5	29.0	5	12	5	7.5 0
42 FT	13	15	11	8	5	8.5	5	7	38.3	33.0	33.0	5	17	25.5	5	17	18.5	4	6	5	7	39.9	95	107	5	7	29.0	5	12	5	7.5 0
44 FT	13	15	11	8	5	8.5	5	6.5	38.1	33.0	33.0	5	16	25.5	5	16	18.5	5	9	5	7	39.9	95	107	5	6.5	29.0	5	12	5	7.5 0
46 FT	13	16	12	8	5	8	5	6.5	38.3	29.0	33.0	5	16	25.5	5	16	18.5	1	6	5	7	40.4	96	108	5	7	29.0	5	12	5	7.5 0
48 FT	14	16	12	8	5	8	5	6.5	38.8	34.0	34.0	5	17	25.0	5	17	18.5	5	9	5	6.5	40.4	96	108	5	6.5	29.0	5	12	5	7 0
50 FT	14	16	12	8	5	7.5	5	6.5	38.8	34.0	34.0	5	17	25.0	5	17	18.5	5	8.5	5	6.5	40.3	96	108	5	6.5	29.0	5	12	5	7 0



SPECIAL DESIGNS ARE REQUIRED WHEN THE DESIGN FILL IS LESS THAN 1 FOOT OR GREATER THAN 50 FEET.

DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.

DESIGN FILLS ARE MEASURED FROM THE TOP OF TOP SLAB TO THE TOP OF EARTH FILL OR ROADWAY.

CULVERTS MEET STRENGTH AND SERVICEABILITY REQUIREMENTS FOR THE DESIGN VEHICULAR LIVE LOAD HL-93 MINUS THE LANE LOAD.



MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)



CONCRETE DOUBLE BOX CULVERT

MEMBER THICKNESS BAR SIZE, SPACING & DIMENSIONS

SPAN (S): 5 FEET HEIGHT (HT): 7 THRU 8 FEET

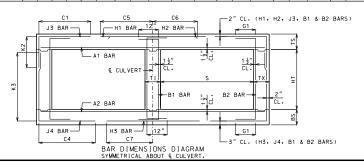
DATE EFFECTIVE: DATE PREPARED: 9/8/2011

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SHEET NO. 5 OF 27

										SI	PAN (S) =	6 F	Т		HE	I GH1	(HT) =	3 F1	OR	4 F		5 FT									
		MEM									TOP SL	AB BARS												OM SLA	B BARS	5						L BAI	
DESIGN		THICK	NE S	5	A1	BARS			J3	BARS				H1 BA	RS		H2 BA	RS	A2	BARS			J4	BARS				нз ва	RS	B1 E	BARS	B2	BARS
FILL	TS	BS	ТX	ΤI	SIZE	SPA.	SIZE	SPA.	C1	HT=3'	K2 HT=4'	HT=5'	SIZE	SPA.	C5	SIZE	SPA.	C6	SIZE	SPA.	SIZE	SPA.	C4	HT=3'	K3 HT=4'	HT=5'	SIZE	SPA.	C7	SIZE	SPA.	SIZE	SPA. G1
1 FT	11	8	8	8	5	8.5	4	9.5	34.5	27.0	27.0	27.0	4	16	64.5	4	16	23.0	4	9.5	4	9.5	37.6	40	52	64	4	6	34.5	5	12	5	12 12
2 FT	11	8	8	8	5	8.5	4	9.5	34.5	27.0	27.0	27.0	4	15	64.5	4	15	22.5	4	9	4	9	35.0	40	52	64	5	7.5	34.0	5	12	5	12 12
4 FT	8	8	8	8	4	8	4	9	34.0	24.0	24.0	24.0	4	13	43.5	4	13	21.0	4	9	4	9.5	32.0	40	52	64	5	7.5	33.5	5	12	5	12 12
6 FT	8	8	8	8	4	9.5	4	9.5	30.4	24.0	24.0	24.0	4	13	35.5	4	13	20.5	4	8.5	4	9	29.9	40	52	64	5	7	32.5	5	12	5	12 12
8 FT	8	8	8	8	4	9	4	9	29.3	24.0	24.0	24.0	4	12	34.0	4	12	20.5	4	7.5	4	8	28.9	40	52	64	5	6.5	32.0	5	12	5	12 0
10 FT	8	9	8	8	4	8	4	8	28.8	24.0	24.0	24.0	5	17	33.0	5	17	20.5	4	7.5	4	10	27.8	41	53	65	5	7	32.0	5	12	5	12 0
12 FT	8	9	8	8	4	7	4	7	28.4	24.0	24.0	24.0	5	16	32.5	5	16	21.5	4	6.5	4	9	27.3	41	53	65	5	6.5	32.0	5	12	5	12 0
14 FT	8	9	8	8	4	7.5	4	7	27.0	24.0	24.0	24.0	5	16	31.5	5	16	21.5	4	6.6	4	9.5	25.9	41	53	65	5	6	32.0	5	12	5	12 0
16 FT	8	10	8	8	4	6.5	4	6	27.1	24.0	24.0	24.0	5	15	31.5	5	15	22.5	4	6.5	4	11.5	25.3	42	54	66	5	6.5	32.0	5	12	5	12 0
18 FT	9	11	8	8	4	6.5	4	7.5	26.6	25.0	25.0	25.0	5	16	31.5	5	16	21.5	4	6.5	4	10.5	25.0	43	55	67	5	7	32.0	5	12	5	12 0
20 FT	10	11	8	8	4	6	4	7.5	26.1	26.0	26.0	26.0	5	15	31.5	5	15	21.0	4	6	4	10	25.3	43	55	67	5	6.5	32.0	5	12	5	12 0
22 FT	10	12	8	8	5	9	4	6.5	26.3	26.0	26.0	26.0	5	15	31.5	5	15	21.5	4	6	4	9.5	24.9	44	56	68	5	6.5	32.0	5	12	5	12 0
24 FT	11	12	8	8	5	9	4	7	25.9	27.0	27.0	27.0	5	14	31.5	5	14	21.0	5	8.5	4	9	25.1	44	56	68	5	6	32.0	5	12	5	12 0
26 FT	11	13	8	8	5	8.5	4	6	26.0	27.0	27.0	27.0	5	14	31.5	5	14	21.5	5	8.5	4	8.5	24.9	45	57	69	5	6	32.0	5	12	5	12 0
28 FT	12	14	8	8	5	8.5	4	6.5	25.9	28.0	28.0	28.0	5	13	31.5	5	13	20.5	5	9	4	7.5	25.0	46	58	70	5	6.5	32.0	5	12	5	12 0
30 FT	13	14	8	8	5	8.5	4	6.5	25.6	29.0	29.0	29.0	5	12	31.0	5	12	20.0	5	8.5	4	7.5	25.1	46	58	70	5	6	32.0	5	12	5	12 0
32 FT	13	15	8	8	5	8	4	6	25.8	29.0	29.0	29.0	5	12	31.0	5	12	20.5	5	8.5	4	7	25.1	47	59	71	5	6	32.0	5	12	5	12 0
34 FT	14	15	8	8	5	8	4	6	25.5	30.0	30.0	30.0	5	12	31.0	5	12	20.0	5	8	4	7	25.3	47	59	71	6	8.5	35.0	5	12	5	12 0
36 FT	14	16	8	8	5	7.5	5	8.5	25.8	30.0	30.0	30.0	5	12	31.0	5	12	20.0	5	8	4	6.5	25.3	48	60	72	5	6	32.0	5	12	5	12 0
38 FT	15	16	8	8	5	7.5	4	6	27.5	31.0	31.0	31.0	5	12	35.5	5	12	25.0	5	7.5	4	6.5	25.4	48	60	72	6	8	35.0	5	12	5	12 0
40 FT	15	17	8	8	5	7	5	8	30.8	31.0	31.0	31.0	6	17	39.5	6	17	29.0	5	7.5	4	6	25.4	49	61	73	6	8.5	35.0	5	12	5	12 0
42 FT	16	17	8	8	5	7	5	7	30.6	32.0	32.0	32.0	5	12	35.0	5	12	25.0	5	7.5	4	6	25.6	49	61	73	6	8	35.0	5	12	5	12 0
44 FT	16	18	8	8	5	6.5	5	7	30.8	32.0	32.0	36.0	6	17	39.0	6	17	29.0	5	7.5	5	6.5	25.6	50	62	74	6	8	35.0	5	12	5	12 0
46 FT	16	18	8	8	5	6	5	7	30.8	32.0	32.0	36.0	6	16	39.0	6	16	29.0	5	7	5	6.5	25.6	50	62	74	6	8	35.0	5	12	5	11.5 0
48 FT	17	19	8	8	5	6.5	5	6.5	30.8	37.0	37.0	37.0	5	12	34.5	5	12	24.5	5	7.5	5	6.5	25.9	51	63	75	6	- 8	35.0	5	12	5	10.5 0
50 FT	17	19	8	8	5	6	5	6.5	30.8	37.0	37.0	37.0	6	16	38.5	6	16	28.5	5	7	5	6.5	25.9	51	63	75	6	7.5	35.0	5	12	5	10 0

										SP	AN (S	5) =	6 F	T		HI	EIGHT	(H	T) =	6 F	T OF	7 F	Т									
		MEM									SLAB										E		SLAB E	BARS						L BA		
DESIGN		THICK	NESS	5	A1	BARS			J3 BA	RS			H1 BA	\RS		H2 B4	\RS	A2	BARS			J4 BA	RS			нз ва	.RS	B1	BARS	B2	2 BARS	ڎ
FILL	TS	BS	тх	ΤI	SIZE	SPA.	SIZE	SPA.	C1		2 HT=7'	SIZE	SPA.	C5	SIZE	SPA.	C6	SIZE	SPA.	SIZE	SPA.	C4	HT=6′	3 HT=7'	SIZE	SPA.	C7	SIZE	SPA.	SIZE	SPA.	G1
1 FT	11	8	8	8	5	8	4	9.5	34.5	27.0	27.0	4	16	64.5	4	16	23.5	4	9	4	7.5	48.9	76	88	5	7.5	34.5	5	12	5	12	12
2 FT	11	8	8	8	5	8	4	9.5	34.5	27.0	27.0	4	15	64.5	4	15	23.0	4	8.5	4	7	45.0	76	88	5	7.5	34.0	5	12	5	12	12
4 FT	8	8	8	8	4	7.5	4	7.5	34.5	24.0	24.0	4	13	64.5	4	13	21.0	4	8.5	4	7	41.6	76	88	5	7	33.5	5	12	5	12	12
6 FT	8	8	8	8	4	9	4	7.5	40.9	24.0	24.0	4	13	36.0	4	13	20.5	4	8	4	6.5	38.1	76	88	5	7	32.5	5	12	5	12	12
8 FT	8	8	8	8	4	9	4	7	37.0	24.0	24.0	4	12	34.0	4	12	20.5	4	7.5	4	6	36.3	76	88	5	6.5	32.0	5	12	5	12	0
10 FT	8	9	8	8	4	8	4	6	35.1	24.0	24.0	5	17	33.0	5	17	21.0	4	7.5	4	6.5	35.5	77	89	5	7	32.0	5	12	5	12	0
12 FT	8	9	8	8	4	7	5	6.5	34.1	24.0	24.0	5	16	32.5	5	16	21.5	4	6.5	4	6	34.5	77	89	5	6.5	32.0	5	12	5	12	0
14 FT	8	9	8	8	4	7	5	6.5	31.8	24.0	24.0	5	16	31.5	5	16	21.5	4	6.5	4	6	32.0	77	89	5	6	32.0	5	12	5	12	0
16 FT	8	10	8	8	4	6.5	5	6	31.6	24.0	24.0	5	15	31.0	5	15	22.5	4	6.5	4	7	32.0	78	90	5	6.5	32.0	5	12	5	12	0
18 FT	9	11	8	8	4	6.5	5	6.5	31.8	25.0	25.0	5	16	31.0	5	16	21.5	4	6.5	4	6.5	32.3	79	91	5	7	32.0	5	12	5	12	0
20 FT		11	8	8	4	6	5	7.5	31.8	26.0	30.0	5	15	31.0	5	15	21.0	4	6	5	7.5	32.1	79	91	5	6.5	32.0	5	12	5	12	0
	10	12	8	8	5	9	5	7	31.6	26.0	30.0	5	15	31.0	5	15	21.5	4	6	5	8	32.3	80	92	5	6.5	32.0	5	12	5	12	0
24 FT	11	12	8	8	5	9	5	7.5	31.8	27.0	31.0	5	14	31.0	5	14	20.5	5	8.5	5	7.5	32.1	80	92	5	6	32.0	5	12	5	12	0
26 FT	11	13	8	8	5	8.5	5	6.5	31.8	27.0	31.0	5	14	31.0	5	14	21.0	5	9	5	7.5	32.3	81	93	5	6	32.0	5	12	5	11	0
28 FT		14	8	8	5	8.5	5	7	31.9	28.0	32.0	5	13	30.5	5	13	20.0	5	9	5	8	32.6	82	94	5	6.5	32.0	5	12	5	10	0
30 FT		14	8	8	5	7.5	5	6.5	31.8	28.0	32.0	5	13	30.5	5	13	20.5	5	8.5	5	7.5	32.5	82	94	5	6	32.0	5	12	5	9.5	0
32 FT	13	15	8	8	5	8	5	6.5	32.0	29.0	33.0	5	12	30.0	5	12	20.0	5	8.5	5	7.5	32.8	83	95	5	6	32.0	5	12	5	9.5	0
34 FT	13	15	8	8	5	7	5	6	31.9	29.0	33.0	5	12	30.0	5	12	20.0	5	8	5	7	32.8	83	95	5	6	32.0	5	12	5	9.5	0
36 FT	14	16	9	8	5	7.5	5	7.5	32.6	30.0	34.0	5	12	29.5	5	12	19.5	5	8	5	8	33.3	84	96	5	6	32.0	5	12	5	9	0
38 FT		16	9	8	5	1	5	1 7	32.5	30.0	34.0	5	12	29.5	5	12	19.5	5	1 8	5	8	33.1	84	96	6	8	35.0	5	12	5	8.5	U
40 FT	15	17	9	8	5	-	5	6.5	37.8	31.0	35.0	5	13	34.0	5	13	24.5	5	1 8	5	8	33.5	85	97	6	8.5	35.0	5	12	5	8.5	U
42 FT	15	17	10	8	5	1	5	7.5	38.3	31.0	35.0	5	12	34.0	5	12	24.5	5	7.5	5	7.5	33.6	85	97	6	8	35.0	5	12	5	9	0
44 FT	15	18	10	8	5	6	5	1	38.4	31.0	35.0	5	12	34.0	5	12	24.5	5	7.5	5	7.5	33.9	86	98	6	8	35.0	5	12	5	8.5	U
46 FT		18	10	8	5	6.5	5	6.5	38.4	32.0	36.0	5	12	33.0	5	12	24.5	5	7.5	5	7.5	34.0	86	98	6	7.5	35.0	5	12	5	8	0
48 FT		19	11	8	5	6.5	5	1 /	39.0	32.0	36.0	5	12	33.0	5	12	24.5	5	7.5	5	8.5	34.4	87	99	6	8	35.0	5	12	5	8.5	U
50 FT	17	19	11	8	1 5	6.5	1 5	_ /	39.1	33.0	37.0	5	13	32.5	5	13	24.5	٥		5	8	34.5	87	99	6	7.5	35.0	5	12	5	8	U



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MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)

CONCRETE



DOUBLE BOX CULVERT

MEMBER THICKNESS BAR SIZE, SPACING & DIMENSIONS

SPAN (S): 6 FEET HEIGHT (HT): 3 THRU 7 FEET

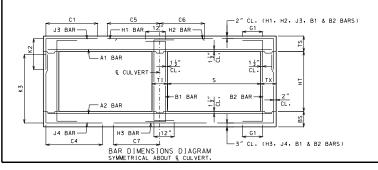
DATE EFFECTIVE: DATE PREPARED:

9/8/2011

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SHEET NO. 6 OF 27

											AN (S		6 F	T		H(EIGHT	(H)	Γ) =	8 F											
		MEM									SLAB	_									Е	MOTTO		BARS					WAL		
DESIGN		THICK	NESS	•	A1	BARS			J3 BA			-	H1 BA			H2 BA	RS	A2	BARS			J4 BA		_		нз ва	RS	B1 I	BARS	B2	BARS
FILL	TS	BS	ТX	ΤĮ	SIZE	SPA.	SIZE	SPA.	C1	HT=8'	2 HT=9'	SIZE	SPA.	C5	SIZE	SPA.	C6	SIZE	SPA.	SIZE	SPA.	C4	HT=8'		SIZE	SPA.	C7	SIZE	SPA.	SIZE	SPA. G
1 FT	11	9	8	8	5	8	4	7	34.5	27.0	27.0	4	16	64.5	4	16	23.5	4	9.5	4	6.5	59.4	101	113	4	6.5	34.5	5	12	5	12 12
2 FT	11	9	8	8	5	8	4	6.5	34.5	27.0	27.0	4	16	64.5	4	16	23.0	4	9	4	6	57.0	101	113	4	6	34.0	5	12	5	12 12
4 FT	8	9	9	8	4	7.5	4	6.5	35.1	24.0	24.0	4	13	65.0	4	13	21.0	4	9.5	4	6.5	53.0	101	113	4	6	33.5	5	12	5	12 12
6 FT	8	9	9	8	4	9	4	6	53.1	24.0	24.0	4	13	36.0	4	13	20.5	4	9	4	6	49.5	101	113	4	6	33.0	5	12	5	12 12
8 FT	8	9	9	8	4	9	5	7	46.5	24.0	28.0	4	12	33.5	4	12	20.5	4	8	5	6.5	46.5	101	113	5	7.5	32.5	5	12	5	12 0
10 FT	8	9	9	8	4	8	5	6	43.8	24.0	28.0	5	17	32.5	5	17	20.5	4	7.5	5	6	44.6	101	113	5	6.5	32.0	5	12	5	11.5 0
12 FT	8	9	10	8	4	7.5	5	6.5	41.8	24.0	28.0	5	17	32.0	5	17	21.5	4	6.5	5	6.5	42.9	101	113	5	6.5	32.0	5	12	5	11.5 0
14 FT	8	9	10	8	4	7.5	5	6.5	38.5	24.0	28.0	5	17	31.0	5	17	21.0	4	6.5	5	6.5	39.6	101	113	5	6	31.5	5	12	5	12 0
16 FT	8	10	10	8	4	6.5	5	6	38.1	24.0	28.0	5	16	31.0	5	16	22.0	4	6.5	5	7	40.6	102	114	5	6.5	32.0	5	12	5	11.5 0
18 FT	9	11	10	8	4	6.5	5	6	38.8	25.0	29.0	5	16	31.0	5	16	21.0	4	6.5	5	7	41.1	103	115	5	7	32.0	5	12	5	10.5 0
20 FT	9	11	10	8	4	6	5	6	38.5	25.0	29.0	5	16	31.0	5	16	22.0	4	6	5	6.5	40.9	103	115	5	6	32.0	5	12	5	10 0
22 FT	10	12	10	8	4	6	5	6.5	39.1	30.0	30.0	5	15	30.5	5	15	21.0	4	6	5	6.5	41.4	104	116	5	6.5	32.0	5	12	5	9 0
24 FT	11	13	10	8	4	6	5	6.5	39.6	31.0	31.0	5	14	30.5	5	14	20.0	4	6	5	6.5	41.8	105	117	5	6.5	32.0	5	12	5	8.5 0
26 FT	11	13	10	8	5	9	5	6	39.4	31.0	31.0	5	14	30.5	5	14	20.5	5	9	5	6.5	41.6	105	117	5	6	32.0	5	12	5	8 0
28 FT	12	14	10	8	5	9	5	6	40.0	32.0	32.0	5	13	30.0	5	13	19.5	4	6	5	6.5	42.0	106	118	5	6.5	32.0	5	12	5	8 0
30 FT	12	14	10	8	5	8	5	6	39.9	32.0	32.0	5	13	30.0	5	13	20.0	5	8.5	5	6	41.9	106	118	5	6	32.0	5	12	5	8 0
32 FT	13	15	11	8	5	8.5	5	7	40.4	33.0	33.0	5	13	29.0	5	13	19.5	5	8.5	5	7	42.3	107	119	5	6	32.0	5	12	5	7.5 0
34 FT	13	15	11	8	5	8	5	6.5	40.3	33.0	33.0	5	13	29.0	5	13	19.5	5	8	5	7	42.1	107	119	6	8	35.0	5	12	5	7.5 0
36 FT	14	16	11	8	5	8	5	6	40.8	34.0	34.0	5	14	28.5	5	14	19.5	5	8.5	5	7	42.6	108	120	5	6	32.0	5	12	5	7.5 0
38 FT	14	16	12	8	5	7.5	5	6.5	40.8	34.0	34.0	5	13	28.5	5	13	19.5	5	7.5	5	6.5	42.5	108	120	6	8	35.0	5	12	5	7 0
40 FT	14	17	12	8	5	7	5	6	40.8	34.0	34.0	5	12	28.5	5	12	19.5	5	8	5	6.5	43.0	109	121	6	8	35.0	5	12	5	7 0
42 FT	15	17	13	8	5	7	5	6	46.4	35.0	35.0	5	13	33.0	5	13	24.5	5	7	5	6	42.8	109	121	6	7.5	35.0	5	12	5	7 0
44 FT	15	18	13	8	5	7	5	6	46.4	35.0	35.0	5	13	33.0	5	13	24.5	5	7.5	5	6	43.3	110	122	6	8	35.0	5	12	5	6.5 0
46 FT	15	18	13	8	5	6	5	6	46.3	35.0	35.0	5	12	33.0	5	12	24.5	5	7.5	5	6	43.3	110	122	6	7.5	35.0	5	12	5	6.5 0
48 FT	16	19	14	8	5	6.5	5	6	47.0	36.0	36.0	5	14	32.5	5	14	24.0	5	7.5	5	6	43.8	111	123	6	7.5	35.0	5	12	5	6.5 0
50 FT	16	19	14	8	5	6	5	6	46.9	36.0	36.0	5	13	32.5	5	13	24.0	5	7	5	6	43.6	111	123	6	7.5	35.0	5	12	5	6.5 0



SPECIAL DESIGNS ARE REQUIRED WHEN THE DESIGN FILL IS LESS THAN 1 FOOT OR GREATER THAN 50 FEET.

DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.

DESIGN FILLS ARE MEASURED FROM THE TOP OF TOP SLAB TO THE TOP OF EARTH FILL OR ROADWAY.

CULVERTS MEET STRENGTH AND SERVICEABILITY REQUIREMENTS FOR THE DESIGN VEHICULAR LIVE LOAD HL-93 MINUS THE LANE LOAD.



MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)



CONCRETE DOUBLE BOX CULVERT

MEMBER THICKNESS BAR SIZE, SPACING & DIMENSIONS

SPAN (S): 6 FEET HEIGHT (HT): 8 THRU 9 FEET SHEET NO.

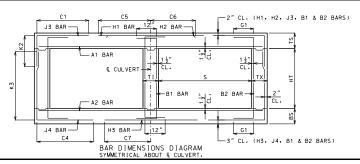
DATE EFFECTIVE: DATE PREPARED: 9/8/2011

703.47

7 OF 27

												• •	7 F	Т		HE	IGHT	(HT) =	4 FT	OR	₹ 5 F		6 FT									
		MEM									TOP SL.	AB BAR												OM SLA	B BARS	5					WAL		
DESIGN		THICH	(NES	S	A1	BARS			J3	BARS				H1 BA	RS		H2 BA	RS	A2	BARS			J4	BARS				нз ва	RS	B1 I	BARS	B2	BARS
FILL	TS	BS	ТX	ΤI	SIZE	SPA.	SIZE	SPA.	C1	HT=4'	K2 HT=5'	HT=6'	SIZE	SPA.	C5	SIZE	SPA.	C6	SIZE	SPA.	SIZE	SPA.	C4	HT=4'	K3 HT=5′	HT=6'	SIZE	SPA.	C7	SIZE	SPA.	SIZE	SPA. G1
1 FT	12	8	8	8	5	8	4	8.5	38.1	28.0	28.0	28.0	4	15	73.0	4	15	25.5	4	7	4	6.5	41.8	52	64	76	5	6.5	37.5	5	12	5	12 12
2 FT	12	9	8	8	5	7.5	4	8.5	38.1	28.0	28.0	28.0	4	14	73.0	4	14	24.5	4	7.5	4	8.5	39.9	53	65	77	5	7	37.5	5	12	5	12 12
4 FT	8	8	8	8	4	6	4	6.5	38.4	24.0	24.0	24.0	5	17	48.0	5	17	23.5	4	7	4	7	35.8	52	64	76	5	6	36.5	5	12	5	12 12
6 FT	8	8	8	8	4	7	4	7	33.9	24.0	24.0	24.0	5	17	39.0	5	17	23.5	4	6.5	4	6.5	33.3	52	64	76	6	7	38.5	5	12	5	12 12
8 FT	8	9	8	8	4	7	4	6.5	32.1	24.0	24.0	24.0	5	16	37.0	5	16	24.0	4	6.5	4	8	31.8	53	65	77	5	6	35.5	5	12	5	12 0
10 FT	8	10	8	8	4	6	5	7	31.5	24.0	24.0	24.0	5	15	36.0	5	15	24.0	4	6.5	4	9.5	30.5	54	66	78	5	6.5	35.5	5	12	5	12 0
12 FT	9	10	8	8	4	6	4	6.5	30.5	25.0	25.0	25.0	5	15	35.5	5	15	24.0	5	9	4	8.5	29.8	54	66	78	5	6	35.5	5	12	5	12 0
14 FT	9	11	8	8	5	8.5	5	7	30.4	25.0	25.0	25.0	5	14	35.5	5	14	24.0	5	9	4	8.5	29.1	55	67	79	5	6	35.5	5	12	5	12 0
16 FT	10	11	8	8	4	6	4	6.5	28.5	26.0	26.0	26.0	5	15	34.5	5	15	23.0	5	8.5	4	8	27.8	55	67	79	5	6	35.0	5	12	5	12 0
18 FT	10	12	8	8	5	8	5	8	28.6	26.0	26.0	26.0	5	14	34.5	5	14	23.5	5	8.5	4	8.5	27.4	56	68	80	5	6	35.0	5	12	5	12 0
20 FT	11	12	8	8	5	8	5	9	28.1	27.0	27.0	27.0	5	14	34.5	5	14	23.5	5	7	4	7	27.5	56	68	80	6	7	38.0	5	12	5	12 0
22 FT	12	13	8	8	5	8	5	8.5	27.9	28.0	28.0	28.0	5	13	34.5	5	13	23.0	5	7.5	4	7	27.5	57	69	81	6	7.5	38.0	5	12	5	12 0
24 FT	12	14	8	8	5	7.5	5	8.5	28.0	28.0	28.0	28.0	5	13	34.5	5	13	23.5	5	7.5	4	7	27.3	58	70	82	6	7.5	38.0	5	12	5	12 0
26 FT	13	15	8	8	5	7	5	8.5	27.9	29.0	29.0	29.0	5	12	34.5	5	12	22.5	5	7.5	4	7	27.4	59	71	83	6	7.5	38.0	5	12	5	12 0
28 FT	14	15	8	8	5	7	5	8.5	27.6	30.0	30.0	30.0	5	12	34.0	5	12	22.0	5	7	4	6.5	27.6	59	71	83	6	7	38.0	5	12	5	12 0
30 FT	14	16	8	8	5	6.5	5	8.5	27.8	30.0	30.0	30.0	5	12	34.0	5	12	22.5	5	7	4	6.5	27.5	60	72	84	6	7	38.0	5	12	5	12 0
32 FT	15	17	8	8	5	6.5	5	8	32.8	31.0	31.0	31.0	6	16	43.0	6	16	30.5	5	7.5	4	6	27.8	61	73	85	6	7.5	38.0	5	12	5	12 0
34 FT	16	17	8	8	5	6.5	5	7	32.6	32.0	32.0	32.0	6	15	42.5	6	15	29.5	5	7	4	6	27.9	61	73	85	6	7	38.0	5	12	5	11.5 0
36 FT	16	18	8	8	5	6	5	7	32.8	32.0	36.0	36.0	6	15	42.5	6	15	30.0	5	7	5	6.5	27.9	62	74	86	6	7	38.0	5	12		10.5 0
38 FT	17	18	8	8	5	6	5	6.5	32.8	37.0	37.0	37.0	6	14	42.0	6	14	29.5	5	6	5	6.5	28.0	62	74	86	6	6.5	38.0	5	12	5	10 0
40 FT	17	19	8	8	5	6	5	6.5	32.8	37.0	37.0	37.0	6	14	42.0	6	14	30.0	5	6.5	5	6.5	28.0	63	75	87	6	7	38.0	5	12		9.5 0
42 FT	18	20	8	8	5	6	5	6.5	32.9	38.0	38.0	38.0	6	14	41.5	6	14	29.5	5	6.5	5	6	28.3	64	76	88	6	7	38.0	5	12		9.5 0
44 FT	18	20	8	8	6	8	5	6.5	32.9	38.0	38.0	38.0	6	14	41.5	6	14	29.5	5	6.5	5	6	28.3	64	76	88	6	6.5	38.0	5	12		9.5 0
46 FT	19	21	8	8	6	8	5	6	33.0	39.0	39.0	39.0	6	14	41.0	6	14	29.5	5	6.5	6	7.5	31.5	65	77	89	6	6.5	38.0	5	12		9.5 0
48 FT	19	21	8	8	6	8	5	6	32.9	39.0	39.0	39.0	6	14	41.0	6	14	29.5	5	6	6	7.5	31.4	65	77	89	6	6.5	38.0	5	12		9.5 0
50 FT	20	22	9	8	6	8	5	6.5	33.8	40.0	40.0	40.0	6	15	40.0	6	15	29.0	5	6	5	6	29.0	66	78	90	6	6.5	38.0	5	12	5	8.5 0

										SP	AN (S	;) =	7 F	T		H	EIGHT	(H)	T) =	7 F	T OF	8 F	Т									
		MEM									SLAB										E		SLAB E	BARS						L BA		
DESIGN	1	LH I CH	NESS		A1	BARS			J3 BA	RS			H1 BA	RS.		H2 B4	RS	Α2	BARS			J4 BA	RS			нз ва	.RS	В1	BARS	Ba	BAR	S
FILL	TS	BS	тх	ΤI	SIZE	SPA.	SIZE	SPA.	C1	HT=7'		SIZE	SPA.	C5	SIZE	SPA.	C6	SIZE	SPA.	SIZE	SPA.	C4	HT=7'		SIZE	SPA.	C7	SIZE	SPA.	SIZE	SPA.	G 1
1 FT	12	9	8	8	5	7.5	4	8.5	38.1	28.0	28.0	4	15	73.0	4	15	25.5	4	7.5	4	7	56.0	89	101	5	7	37.5	5	12	5	12	12
2 FT	12	9	8	8	5	7.5	4	8	38.1	28.0	28.0	4	15	73.0	4	15	25.0	4	7	4	6.5	51.4	89	101	5	7	37.5	5	12	5	12	12
4 FT	8	9	8	8	4	6	5	6.5	40.1	24.0	24.0	5	17	75.0	5	17	23.5	4	7.5	4	6.5	47.8	89	101	5	7	37.0	5	12	5	12	12
6 FT	8	9	8	8	4	7	5	6.5	44.6	24.0	24.0	5	17	39.5	5	17	23.5	4	7	4	6	43.5	89	101	5	6.5	36.0	5	12	5	12	12
8 FT	8	9	9	8	4	7	4	6	40.1	24.0	24.0	5	16	37.0	5	16	23.5	4	6.5	4	6.5	40.4	89	101	5	6	35.5	5	12	5	12	0
10 FT	8	10	9	8	4	6.5	5	6	38.4	24.0	24.0	5	15	36.0	5	15	24.0	4	6.5	4	7	39.5	90	102	5	6.5	35.5	5	12	5	12	0
12 FT	9	10	9	8	4	6	5	6.5	37.8	25.0	25.0	5	15	35.5	5	15	24.0	5	9	4	6	38.1	90	102	5	6	35.0	5	12	5	12	0
14 FT	9	11	9	8	5	8.5	5	6	37.1	25.0	25.0	5	14	35.0	5	14	23.5	5	9	4	6	37.9	91	103	5	6	35.5	5	12	5	12	0
16 FT	9	11	9	8	5	8.5	5	6	34.8	25.0	25.0	5	14	34.0	5	14	23.5	5	8.5	4	6	35.3	91	103	5	6	35.0	5	12	5	12	0
18 FT	10	12	9	8	5	8.5	5	7	34.9	26.0	30.0	5	14	34.0	5	14	23.5	5	8.5	5	8.5	35.3	92	104	5	6	35.0	5	12	5	12	0
20 FT	11	13	9	8	5	8	5	7.5	34.9	27.0	31.0	5	14	34.0	5	14	23.0	5	8.5	5	8	35.4	93	105	6	8	38.0	5	12	5	12	0
22 FT	11	13	9	8	5	7	5	6.5	34.8	27.0	31.0	5	13	34.0	5	13	23.5	5	7.5	5	8	35.1	93	105	6	7.5	38.0	5	12	5	11.5	0
24 FT	12	14	9	8	5	7.5	5	7	34.8	28.0	32.0	5	13	34.0	5	13	23.0	5	8	5	8	35.4	94	106	6	7.5	38.0	5	12	5	10.5	0
26 FT	13	15	9	8	5	7.5	5	7	34.9	29.0	33.0	5	12	33.5	5	12	22.0	5	8	5	8	35.6	95	107	6	7.5	38.0	5	12	5	9.5	0
28 FT	13	15	9	8	5	6.5	5	6.5	34.8	33.0	33.0	5	12	33.5	5	12	22.5	5	7	5	7.5	35.4	95	107	6	7	38.0	5	12	5	9	0
30 FT	14	16	9	8	5	7	5	6.5	34.9	34.0	34.0	5	12	33.0	5	12	21.5	5	7.5	5	7.5	35.6	96	108	6	7	38.0	5	12	5	8.5	0
32 FT	15	17	9	8	5	7	5	6	40.0	35.0	35.0	6	16	41.5	6	16	29.5	5	7.5	5	7.5	36.0	97	109	6	7.5	38.0	5	12	5	8.5	0
34 FT	15	17	10	8	5	6.5	5	7	40.5	35.0	35.0	6	16	41.5	6	16	30.0	5	6.5	5	7.5	36.0	97	109	6	7	38.0	5	12	5	8.5	0
36 FT	16	18	10	8	5	6.5	5	6.5	40.6	36.0	36.0	6	15	41.0	6	15	29.5	5	7	5	7.5	36.4	98	110	6	7	38.0	5	12	5	8	0
38 FT	16	19	11	8	5	6	5		41.3	32.0	36.0	6	15	40.5	6	15	29.5	5	1 6 5	5	1	36.8	99	111	6		38.0	5	12	5	8.5	0
40 FT	17	19	11	8	5	6	5	(-	41.3	33.0	37.0	6	15	40.0	6	15	29.0	5	6.5	5	7	36.8	99	111	6	6.5	38.0	5	12	5	7.5	0
42 FT		20	11	8	5	6	5	6.5	41.4	37.0		6	15	40.0	6	15	29.0	5	6.5	5	1 7	36.9	100	112	6		38.0	5	12	5		0
44 FT		20	11	8	6	8.5	5	6		38.0	38.0	6	16	39.5	6	16	29.0	5	6.5	5	7		100	112	6	6.5	38.0	5	12	5	7.5	0
46 FT	18	21	12	8	6	8	5	6.5	42.1	38.0	38.0	6	15	39.5	6	15	29.0	5	6.5	_	C E	37.4	101	113	6	6.5	38.0	5	12	5	7.5	0
48 FT	19		12	8	6	8	5	6.5	42.0	39.0	39.0	6		39.0	6	16		5	6	5	6.5	37.6	101	114	6	6.5	38.0	5		5	7	0
50 FT	19	22	12	8	6	7.5	5	ا ا	42.1	22.0	39.0	6	15	39.0	6	15	29.0	5	6	כ	6.5	31.6	102	114	ь	6.5	38.0	5	12	5	/	10



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CONCRETE DOUBLE BOX CULVERT

MEMBER THICKNESS BAR SIZE, SPACING & DIMENSIONS

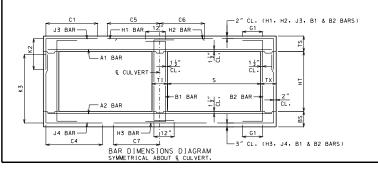
SPAN (S): 7 FEET HEIGHT (HT): 4 THRU 8 FEET

DATE EFFECTIVE: DATE PREPARED: 9/8/2011

703.47

SHEET NO. 8 OF 27

										SPA			7 FT			HE	IGHT	(HT:) = 9	FT		10 FT										
	Ι.	_ MEM					_				SLAB	_									E	BOTTOM		BARS	_				WAL			=
DESIGN		THICH	ME 25	•	A1	BARS			J3 BA				H1 BA	RS		H2 BA	RS	A2	BARS			J4 BA				нз ва	RS	B1	BARS	B2	2 BARS	-
FILL	TS	BS	ТX	ΤI	SIZE	SPA.	SIZE	SPA.	C1		12 HT=10	SIZE	SPA.	C5	SIZE	SPA.	C6	SIZE	SPA.	SIZE	SPA.	C4	HT=9'	3 HT=10'	SIZE	SPA.	C7	SIZE	SPA.	SIZE	SPA.	G 1
1 FT	12	9	8	8	5	7.5	4	6	38.1	28.0	28.0	4	16	73.0	4	16	26.0	4	7	6	7	68.1	113	125	5	7	38.0	5	12	5	12	12
2 FT	12	9	8	8	5	7.5	5	8.5	38.1	28.0	32.0	4	15	73.0	4	15	25.0	4	6.5	6	6.5	64.9	113	125	5	6.5	37.5	5	12	5		12
4 FT	8	9	9	8	4	6	5	6	40.8	24.0	28.0	5	17	75.5	5	17	23.5	4	7.5	5	6	57.8	113	125	5	7	37.0	5	12	5	11.5	12
6 FT	8	9	10	8	4	7	5	6.5	55.0	24.0	28.0	5	17	39.5	5	17	23.0	4	7	5	6.5	51.9	113	125	5	6.5	36.0	5	12	5	11.5	12
8 FT	8	9	10	8	4	7	5	6	49.0	28.0	28.0	5	16	37.0	5	16	23.5	4	6.5	5	6	49.3	113	125	5	6	35.5	5	12	5	10.5	0
10 FT	8	10	10	8	4	6.5	6	7	49.0	28.0	28.0	5	15	36.0	5	15	24.0	4	6.5	5	6	49.1	114	126	5	6	35.5	5	12	5	10	0
12 FT	9	10	10	8	4	6	5	6	46.1	29.0	29.0	5	16	35.5	5	16	23.5	5	9	ø	7	50.3	114	126	5	6	35.0	5	12	5		0
14 FT	9	11	10	8	5	9	5	6	44.6	29.0	29.0	5	15	35.0	5	15	23.5	5	9	6	7.5	50.6	115	127	5	6	35.0	5	12	5		0
16 FT	9	11	10	8	5	9	5	6	41.5	29.0	29.0	5	14	34.0	5	14	23.5	5	8.5	5	6	44.0	115	127	5	6	35.0	5	12	5	9.5	0
18 FT	10	12	10	8	5	8.5	5	6.5	42.0	30.0	30.0	5	15	34.0	5	15	23.5	5	8.5	5	6	44.3	116	128	5	6	35.0	5	12	5	8.5	0
20 FT	11	13	10	8	5	8.5	5	6	42.4	31.0	31.0	5	14	33.5	5	14	22.5	5	8.5	5	6	44.6	117	129	6	8	38.0	5	12	5		0
22 FT	11	13	10	8	5	7.5	5	6	42.1	31.0	31.0	5	14	33.5	5	14	23.5	5	7.5	6	7	47.3	117	129	6	7.5	38.0	5	12	5		0
24 FT	12	14	10	8	5	7.5	5	6	42.5	32.0	32.0	5	13	33.5	5	13	22.5	5	8	6	7.5	47.6	118	130	6	7.5	38.0	5	12	5		0
26 FT	13	15	10	8	5	7.5	6	7	45.8	33.0	37.0	5	12	33.0	5	12	21.5	5	8	6	7.5	47.9	119	131	6	7.5	38.0	5	12	5		0
28 FT	13	16	11	8	5	7	5	6	42.9	33.0	33.0	5	12	32.5	5	12	22.0	5	8	5	6.5	45.3	120	132	6	7.5	38.0	5	12	5		0
30 FT	14	16	11	8	5	7	6	7.5	46.1	34.0	34.0	5	12	32.0	5	12	21.0	5	7.5	5	6	45.0	120	132	6	7	38.0	5	12	5		0
32 FT	14	17	12	8	5	7	5	6	43.4	34.0	34.0	5	12	32.0	5	12	21.5	5	7.5	5	6.5	45.4	121	133	6	7	38.0	5	12	5		0
34 FT	15	17	12	8	5	6.5	6	8.5	52.6	35.0	35.0	6	16	40.5	6	16	29.5	5	6.5	5	6.5	45.1	121	133	6	7	38.0	5	12	5		0
36 FT	15	18	13	8	5	6	6	8.5	52.9	35.0	35.0	6	16	40.0	6	16	29.5	5	7	5	6	45.5	122	134	6	7	38.0	5	12	5		0
38 FT	16	19	13	8	5	6.5	6	8	53.1	36.0	36.0	6	16	39.5	6	16	29.0	5	7	5	6	45.9	123	135	6	7	38.0	5	12	5		0
40 FT	17	19	13	8	5	6	6	7.5	53.4	37.0	37.0	5	12	35.0	5	12	25.0	5	6.5	5	6	45.8	123	135	6	6.5	38.0	5	12	5		0
42 FT	17	20	14	8	5	6	6	8	53.8	37.0	37.0	6	16	39.0	6	16	29.0	5	6.5	5	6	46.1	124	136	6	6.5	38.5	5	12	5		0
44 FT	17	20	14	8	6	8.5	6	7.5	53.6	37.0	37.0	6	15	39.0	6	15	29.0	5	6	5	6	46.1	124	136	6	6.5	38.5	5	12	5		0
46 FT	18	21	14	8	6	8	6	7	53.9	38.0	38.0	6	17	38.5	6	17	29.0	5	6.5	5	6	46.5	125	137	6	6.5	38.0	5	12	5	_	0
48 FT	18	22	15	8	6	8	6	7.5	54.3	38.0	42.0	6	16	38.5	6	16	29.0	5	6.5	6	8	49.9	126	138	6	6.5	38.5	5	12	5		0
50 FT	18	22	15	8	6	7.5	6	7.5	54.3	38.0	42.0	6	15	38.5	6	15	29.0	5	6	6	8	49.9	126	138	6	6	38.5	5	12	6	8	0



SPECIAL DESIGNS ARE REQUIRED WHEN THE DESIGN FILL IS LESS THAN 1 FOOT OR GREATER THAN 50 FEET.

DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.

DESIGN FILLS ARE MEASURED FROM THE TOP OF TOP SLAB TO THE TOP OF EARTH FILL OR ROADWAY.

CULVERTS MEET STRENGTH AND SERVICEABILITY REQUIREMENTS FOR THE DESIGN VEHICULAR LIVE LOAD HL-93 MINUS THE LANE LOAD.



MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)

CONCRETE



DOUBLE BOX CULVERT

MEMBER THICKNESS BAR SIZE, SPACING & DIMENSIONS

SPAN (S): 7 FEET HEIGHT (HT): 9 THRU 10 FEET

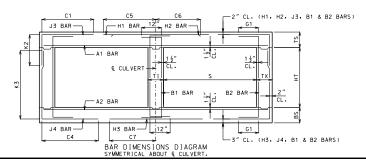
DATE EFFECTIVE: DATE PREPARED: 9/8/2011

703.47

SHEET NO. 9 OF 27

										SI	PAN (S) =	8 F	Т		HE	I GH1	(HT) =	4 FT	OR	5 F	T OR	6 FT										
		MEM									TOP SL	AB BARS											BOTT	OM SLA	B BARS	S					WAL			
DESIGN		THICK	NES:	5	A1	BARS			J3	BARS				H1 BA	RS		H2 BA	RS	A2	BARS			J4	BARS				нз ва	RS	B1 8	BARS	B2	2 BARS	
FILL	TS	BS	ТX	ΤI	SIZE	SPA.	SIZE	SPA.	C1	HT=4'	K2 HT=5'	HT=6'	SIZE	SPA.	C5	SIZE	SPA.	C6	SIZE	SPA.	SIZE	SPA.	C4	HT=4'	K3 HT=5'	HT=6'	SIZE	SPA.	C7	SIZE	SPA.	SIZE	SPA. G	31
1 FT	12	9	8	8	5	7	4	8.5	41.8	28.0	28.0	28.0	4	12	81.5	4	12	26.5	4	7	4	8	43.0	53	65	77	5	6.5	41.0	5	12	5	12 1	2
2 FT	13	9	8	8	5	7.5	4	7.5	41.8	29.0	29.0	29.0	4	13	81.5	4	13	26.5	4	6.5	4	7	39.1	53	65	77	5	6	40.5	5	12	5	12 1	12
4 FT	8	8	8	8	4	6	5	6.5	36.4	24.0	24.0	24.0	5	15	51.0	5	15	26.5	4	6	4	6	35.3	52	64	76	6	6.5	42.5	5	9.5	5	12 1	12
6 FT	8	9	8	8	4	6	5	6.5	34.3	24.0	24.0	24.0	5	15	42.5	5	15	26.0	4	6	4	7.5	33.1	53	65	77	6	7	42.0	5	12	5		12
8 FT	8	9	8	8	4	6	5	6	33.1	24.0	24.0	24.0	5	13	40.5	5	13	25.5	5	8.5	4	7	31.6	53	65	77	6	6.5	41.5	5	12	5	12 (0
10 FT	9	10	8	8	5	8.5	4	6	31.9	25.0	25.0	25.0	5	14	39.5	5	14	25.5	5	8	4	8	30.4	54	66	78	6	7	41.5	5	12	5	12 (0
12 FT	10	11	8	8	5	8	4	6	30.6	26.0	26.0	26.0	5	14	39.0	5	14	25.0	5	8	4	8	29.3	55	67	79	6	7	41.5	5	12	5	12 (٥
14 FT	11	12	8	8	5	8	4	6	29.8	27.0	27.0	27.0	5	14	38.5	5	14	25.0	5	7.5	4	7.5	28.6	56	68	80	6	7	41.5	5	12	5	12 (
16 FT	11	13	8	8	5	7.5	5	8.5	29.6	27.0	27.0	27.0	5	12	38.5	5	12	25.0	5	7.5	4	8	28.0	57	69	81	6	7	41.5	5	12	5	12 0	
18 FT	12	13	8	8	5	7.5	4	6	27.5	28.0	28.0	28.0	5	13	37.5	5	13	25.0	5	7	4	7.5	26.8	57	69	81	6	7	41.0	5	12	5	12 0	
20 FT	12	14	8	8	5	7	5	8.5	27.8	28.0	28.0	28.0	5	12	37.5	5	12	25.0	5	7	4	7.5	26.4	58	70	82	6	7	41.5	5	12	5	12 0	
22 FT	13	15	8	8	5	6.5	6	8.5	27.4	29.0	29.0	29.0	5	12	37.5	5	12	25.0	5	7	4	7	26.4	59	71	83	6	7	41.5	5	12	5	12 0	
24 FT	14	16	8	8	5	6.5	5	8.5	27.3	30.0	30.0	30.0	5	12	37.5	5	12	24.5	5	7	4	6.5	26.5	60	72	84	6	7	41.5	5	12	5	12 0	0
26 FT	15	16	8	8	5	6.5	5	8	31.9	31.0	31.0	31.0	6	16	46.5	6	16	33.0	5	6.5	4	6.5	26.6	60	72	84	6	7	41.0	5	12	5	12 (
28 FT	16	17	8	8	5	6	5	7	31.8	32.0	32.0	32.0	6	15	46.0	6	15	32.0	5	6.5	4	6	26.8	61	73	85	6	6.5	41.0	5	12	5	12 (
30 FT	16	18	8	8	5	6	5	7	32.0	32.0	32.0	36.0	6	15	46.0	6	15	33.0	5	6.5	5	6.5	26.6	62	74	86	6	6.5	41.0	5	12	5	12 (
32 FT	17	19	8	8	5	6	5	6.5	31.9	37.0	37.0	37.0	6	14	45.5	6	14	32.0	5	6.5	5	6.5	26.8	63	75	87	6	6.5	41.0	5	12	5	12 (
34 FT	18	19	8	8	6	8.5	5	6.5	31.8	38.0	38.0	38.0	6	13	45.5	6	13	31.0	5	6	5	6.5	26.9	63	75	87	6	6	41.0	5	12	5	11 (
36 FT	18	20	8	8	6	8	5	6.5	31.9	38.0	38.0	38.0	6	13	45.5	6	13	32.0	5	6	5	6	26.9	64	76	88	6	6	41.0	5	12	5	10 0	
38 FT	19	21	8	8	6	8	5	6	32.0	39.0	39.0	39.0	6	13	45.0	6	13	31.0	5	6	6	7.5	30.1	65	77	89	6	6	41.0	5	12	5	9.5	
40 FT	20	22	8	8	6	7.5	6	7.5	36.0	44.0	44.0	44.0	6	13	44.5	6	13	30.5	5	6	6	7	30.4	66	78	90	6	6	41.0	5	12	5	9.5	
42 FT	20	22	8	8	6	7.5	6	7.5	36.0	44.0	44.0	44.0	6	12	44.5	6	12	30.5	6	8.5	6	7	30.3	66	78	90	6	6	41.0	5	12	5	9.5	
44 FT	21	23	8	8	6	7.5	6	7	36.0	45.0	45.0	45.0	6	12	43.5	6	12	30.0	6	8.5	6	6.5	30.5	67	79	91	6	6	41.0	5	12	5	9.5	
46 FT	21	23	8	8	6	7	6	7	36.0	45.0	45.0	45.0	6	12	43.5	6	12	30.0	6	8	6	6.5	30.5	67	79	91	7	7.5	44.0	5	12	5	9.5	_
48 FT	22	24	8	8	6	7	6	6.5	36.1	46.0	46.0	46.0	6	12	43.0	6	12	30.0	6	8	6	6	30.8	68	80	92	7	7.5	44.0	5	12	5	9 (
50 FT	22	24	8	8	6	6.5	6	6.5	36.1	46.0	46.0	46.0	6	12	43.0	6	12	30.0	6	7.5	6	6	30.8	68	80	92	7	7.5	44.0	5	12	5	8.5 0	0
										-						_																	$\overline{}$	\neg

										S	PAN (S) =	8 F	T		H	E I GH	T (HT) =	7 F1	OR	8 F	T OR	9 FT										
		MEM									TOP SL	AB BAR	ŝ										BOTT	OM SLA	AB BAR	S					₩AL	L BAI	RS	
DESIGN		THIC	(NES	5	Α1	BARS			J3	BARS				H1 B	ARS		H2 B4	\RS	Α2	BARS			J4	BARS				нз ва	RS	B1 E	BARS	B2	2 BARS	S
FILL	TS	BS	тх	ΤI	SIZE	SPA.	SIZE	SPA.	C1	HT=7'	K2 HT=8'	HT=9'	SIZE	SPA.	C5	SIZE	SPA.	C6	SIZE	SPA.	SIZE	SPA.	C4	HT=7'	K3 HT=8'	HT=9'	SIZE	SPA.	C7	SIZE	SPA.	SIZE	SPA.	G1
1 FT	12	9	8	8	5	7	4	6.5	41.8	28.0	28.0	28.0	4	12	81.5	4	12	27.5	4	6	5	6.5	61.6	89	101	113	5	6	41.0	5	12	5	12	12
2 FT	13	10	8	8	5	7	4	6.5	41.8	29.0	29.0	29.0	4	13	81.5	4	13	27.0	4	6.5	4	6	58.3	90	102	114	5	6.5	40.5	5	12	5	12	12
4 FT	8	9	8	8	4	6	6	7.5	43.8	24.0	24.0	28.0	5	15	83.5	5	15	27.0	4	6	5	6	52.3	89	101	113	5	6	40.0	5	11	5	12	12
6 FT	8	10	8	8	4	6	6	7.5	51.4	24.0	24.0	28.0	5	15	43.0	5	15	26.0	4	6.5	5	6	49.0	90	102	114	5	6.5	39.5	5	12	5	12	12
8 FT	8	11	8	8	4	6	6	7.5	46.6	24.0	24.0	28.0	5	13	40.5	5	13	25.5	4	6.5	5	6.5	46.3	91	103	115	5	6	39.0	5	12	5	12	0
10 FT	9	11	8	8	5	8.5	6	7	45.3	25.0	25.0	29.0	5	14	39.5	5	14	25.5	5	8.5	5	6	43.6	91	103	115	5	6	38.5	5	12	5	11	0
12 FT	10	12	8	8	5	8	6	7	44.4	26.0	30.0	30.0	5	14	39.0	5	14	25.0	5	8.5	5	6	42.5	92	104	116	5	6	38.5	5	12	5	10	0
14 FT	11	12	8	8	5	8	6	7	43.5	27.0	31.0	35.0	5	14	38.5	5	14	25.0	5	7.5	6	7	44.4	92	104	116	6	7	41.5	5	12	5	9.5	0
16 FT	11	13	8	8	5	7.5	6	6.5	42.9	27.0	31.0	35.0	5	12	38.0	5	12	25.0	5	7.5	6	7	44.0	93	105	117	6	7.5	41.5	5	12	5	9.5	0
18 FT	12	13	8	8	5	7.5	5	6	37.1	28.0	32.0	32.0	5	13	37.5	5	13	25.0	5	7	6	7.5	41.1	93	105	117	6	7	41.0	5	12	5	9.5	0
20 FT	12	14	8	8	5	7	6	7	39.9	32.0	32.0	36.0	5	12	37.5	5	12	25.0	5	7	6	7.5	41.1	94	106	118	6	7	41.0	5	12	5	9.5	0
22 FT	13	15	8	8	5	6.5	6	7	39.9	33.0	33.0	37.0	5	12	37.0	5	12	25.0	5	7	6	7.5	41.3	95	107	119	6	7	41.0	5	12	5	9.5	0
24 FT	14	16	8	8	5	6.5	6	7	40.0	34.0	34.0	38.0	5	12	37.0	5	12	24.0	5	7	6	7	41.4	96	108	120	6	7	41.0	5	12	5	9	0
26 FT	15	16	9	8	5	6.5	5	6	42.4	35.0	35.0	35.0	6	16	45.5	6	16	32.0	5	6.5	5	6	38.5	96	108	120	6	7	41.0	5	12	5	8.5	0
28 FT	15	17	10	8	5	6	5	6.5	42.9	31.0	35.0	35.0	6	16	45.5	6	16	33.0	5	6.5	5	7.5	38.8	97	109	121	6	6.5	41.5	5	12	5	8	0
30 FT	16	18	11	8	5	6	5	6.5	43.6	32.0	36.0	36.0	6	15	44.5	6	15	31.5	5	6.5	5	7	39.1	98	110	122	6	6.5	41.5	5	12	5	8.5	0
32 FT	17	19	11	8	5	6	5	6.5	43.6	33.0	37.0	37.0	6	14	44.0	6	14	31.0	5	6.5	5	7	39.4	99	111	123	6	6	41.5	5	12	5	7.5	0
34 FT	17	20	11	8	6	8	5	6	43.8	37.0	37.0	37.0	6	14	44.0	6	14	31.5	5	6.5	5	7	39.5	100	112	124	6	6	41.5	5	12	5	7.5	0
36 FT	18	20	12	8	6	8	5	6.5	44.3	38.0	38.0	38.0	6	13	43.5	6	13	30.5	5	6	5	6.5	39.6	100	112	124	6	6	41.5	5	12	5	7.5	0
38 FT	18	21	12	8	6	7.5	5	6	44.4	38.0	38.0	38.0	6	13	43.5	6	13	31.0	5	6	5	6.5	39.9	101	113	125	6	6	41.5	5	12	5	7	0
40 FT	19	22	12	8	6	7.5	6	8.5	48.4	39.0	39.0	39.0	6	13	42.5	6	13	30.0	5	6	5	6.5	40.1	102	114	126	6	6	41.5	5	12	5	7	0
42 FT	19	22	13	8	6	7	5	6	45.0	39.0	39.0	39.0	6	13	42.5	6	13	30.5	6	8	5	6.5	40.3	102	114	126	7	7.5	44.5	5	12	5	7	0
44 FT	20	23	13	8	6	7	6	8.5	49.1	40.0	40.0	40.0	6	13	42.0	6	13	30.0	6	8	5	6	40.5	103	115	127	7	7.5	44.5	5	12	5	7	0
46 FT	20	24	13	8	6	6.5	6	8	49.3	40.0	40.0	40.0	6	12	42.0	6	12	30.0	6	8	5	6	40.6	104	116	128	7	7.5	44.5	5	12	5	6.5	0
48 FT	21	24	13	8	6	7	6	7.5	49.1	41.0	41.0	41.0	6	13	41.5	6	13	29.5	6	8	5	6	40.8	104	116	128	7	7.5	44.5	5	12	5	6.5	0
50 FT	21	25	14	8	6	6.5	6	8	49.9	41.0	41.0	41.0	6	13	41.5	6	13	29.5	6	8	5	6.5	41.1	105	117	129	7	7.5	44.5	5	12	5	6.5	0



SPECIAL DESIGNS ARE REQUIRED WHEN THE DESIGN FILL IS LESS THAN 1 FOOT OR GREATER THAN 50 FEET.

DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.

DESIGN FILLS ARE MEASURED FROM THE TOP OF TOP SLAB TO THE TOP OF EARTH FILL OR ROADWAY.

CULVERTS MEET STRENGTH AND SERVICEABILITY REQUIREMENTS FOR THE DESIGN VEHICULAR LIVE LOAD HL-93 MINUS THE LANE LOAD.



MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)



CONCRETE DOUBLE BOX CULVERT

MEMBER THICKNESS BAR SIZE, SPACING & DIMENSIONS

SPAN (S): 8 FEET HEIGHT (HT): 4 THRU 9 FEET

SHEET NO.

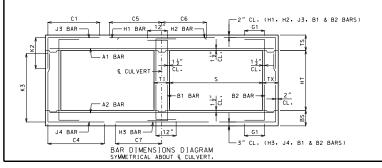
DATE EFFECTIVE: DATE PREPARED:

9/8/2011

703.47

10 OF 27

										SPA	N (S)) =	8 FT			HE	IGHT	(HT) = 1	10 F	T OR	11 F	T									
		MEM									SLAB	BARS									E	MOTTO		BARS						L BA		
DESIGN		THICK	MES	5	A1	BARS			J3 BA				H1 BA	RS		H2 BA	RS	A2	BARS			J4 BAI				нз ва	RS	B1 1	BARS	B2	2 BAR	ŝ
FILL	TS	BS	ТX	ΤI	SIZE	SPA.	SIZE	SPA.	C1	HT=10'	2 HT=11	SIZE	SPA.	C5	SIZE	SPA.	C6	SIZE	SPA.	SIZE	SPA.	C4	HT=10	3 HT=11'	SIZE	SPA.	C7	SIZE	SPA.	SIZE	SPA.	G1
1 FT	12	9	8	9	5	7	5	7.5	41.9	32.0	32.0	4	12	81.5	4	12	27.5	5	9	6	6	73.9	125	137	5	6	41.5	5	12	5	10.5	12
2 FT	13	10	9	9	5	7	5	8	42.5	29.0	33.0	4	13	82.0	4	13	27.0	4	6	5	6	66.8	126	138	5	6.5	41.0	5	12	5	11	12
4 FT	8	11	9	9	4	6	6	7	44.5	24.0	28.0	5	16	84.0	5	16	27.0	4	7	5	6	66.0	127	139	5	7.5	41.0	5	10.5	5	9.5	12
6 FT	8	11	9	9	4	6	6	7	61.5	28.0	32.0	5	15	43.0	5	15	26.0	4	6.5	6	7	64.5	127	139	5	7	40.0		11.5	5	9	12
8 FT	8	11	9	9	4	6	6	7	55.6	28.0	32.0	5	14	40.5	5	14	25.5	4	6	6	6.5	60.4	127	139	5	6	39.5		11.5	5	8.5	0
10 FT	9	11	9	9	5	8.5	6	7.5	54.9	29.0	33.0	5	14	39.5	5	14	25.5	5	8.5	6	6	57.5	127	139	5	6	39.0	5	12	5	8.5	0
12 FT	10	11	9	9	5	8	5	6	51.1	30.0	30.0	5	14	39.0	5	14	25.5	5	7.5	6	6	55.3	127	139	6	7	41.5	5	12	5	8.5	0
14 FT	10	12	9	9	5	8	6	6.5	52.0	30.0	34.0	5	13	38.5	5	13	25.5	5	7.5	6	6	54.8	128	140	6	7	41.5	5	12	5	8.5	0
16 FT	11	13	10	9	5	7.5	5	6	48.6	31.0	31.0	5	13	38.0	5	13	25.5	5	7.5	6	6.5	54.1	129	141	6	7.5	41.5	5	12	5	8	0
18 FT	11	13	10	9	5	7.5	5	6	45.1	31.0	31.0	5	12	37.0	5	12	25.0	5	7	6	6.5	50.4	129	141	6	7	41.5	5	12	5	8	0
20 FT	12	14	10	9	5	7	6	7.5	48.4	32.0	36.0	5	13	37.0	5	13	25.0	5	7	6	6.5	50.5	130	142	6	7.5	41.5	5	12	5	8	0
22 FT	13	15	10	9	5	7	6	7	48.5	33.0	37.0	5	12	37.0	5	12	24.5	5	7	6	6.5	50.6	131	143	6	7	41.5	5	12	5	8	0
24 FT	13	16	11	9	5	6.5	6	8	48.5	33.0	33.0	5	12	36.5	5	12	25.0	5	7	5	6	47.8	132	144	6	7	41.5	5	12	5	7.5	0
26 FT	14	16	12	9	5	6.5	5	6	46.0	34.0	34.0	5	12	36.0	5	12	24.5	5	6	5	6	47.5	132	144	6	7	41.5	5	12	5	7	0
28 FT	15	17	12	9	5	6.5	6	8	55.3	35.0	35.0	6	16	44.5	6	16	32.5	5	6.5	5	6	47.8	133	145	6	6.5	41.5	5	12	5	1	0
30 FT	16	18	13	9	5	6.5	6	8	55.8	36.0	36.0	6	15	44.0	6	15	31.5	5	6.5	5	6	48.0	134	146	6	6.5	41.5	5	12	5	6.5	0
32 FT	16	19	13	9	5	6	6	7.5	55.8	36.0	36.0	6	15	44.0	6	15	32.0	5	6.5	5	6	48.3	135	147	6	6	41.5	5	12	5	6.5	0
34 FT	17	20	13	9	5	8	6	7.5	56.0	37.0	37.0	6	14	43.5	6	14	31.5	5	6.5	5	6	48.5	136	148	6	6.5	41.5	5	12	5	6.5	0
38 FT	18	21	14	9	6	8	6	1.5	56.4	38.0	38.0	6	13	42.5	6	13	30.5	5	6	5	6	48.9	137	149	6	6	41.5	5	12	5	6	0
	18	22	15	9	6	0 7	6	7.5	56.8	38.0	42.0	6	13	42.5	6	13	30.5	5	6	6	8	52.3	138	150	6	6	41.5	5	12	6	8	-
40 FT	19	22	15	9	6	7.5	6	7	57.0	39.0	43.0	6	14	42.0	6	14	30.0	6	8.5	6	8	52.3	138	150	7	7.5	44.5	5	12	6	8	0
44 FT	19	23	15	9	6	6.5	6	6.5	56.9	39.0	43.0	6	13	42.0	6	13	30.0	6	8.5	6	8	52.5	139	151	7	8	44.5	5	12	6	8	0
46 FT	20	24	16	9	6	7	6	7	57.6	40.0	44.0	6	14	41.5	6	14	30.0	6	8	6	7.5	52.9	140	152	7	8	44.5	5	12	6	8	0
48 FT	20	24	16	9	6	6.5	6	6.5	57.5	40.0	44.0	6	13	41.5	6	13	30.0	6	8	6	7.5	52.9	140	152	7	7.5	44.5	5	12	6	8	0
50 FT	21	25	16	9	6	6.5	6	6	57.8	41.0	45.0	6	14	41.0	6	14	30.0	6	8	6	7.5	53.1	141	153	7	7.5	44.5	5	12	6	8	0



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MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)



CONCRETE DOUBLE BOX CULVERT

MEMBER THICKNESS BAR SIZE, SPACING & DIMENSIONS

SPAN (S): 8 FEET HEIGHT (HT): 10 THRU 11 FEET

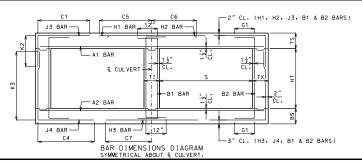
DATE EFFECTIVE: DATE PREPARED: 9/8/2011

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SHEET NO. 11 OF 27

												S) =	_	T		HE	[GH	(HT) =	5 F I	r or	? 6 F		7 FT										_
	Ι.	_ MEM		_							TOP SL	AB BARS									_			TOM SLA	B BARS	5				_		L BA		_
DESIGN		THIC	VIVE 5	•	A1	BARS	_		J 5	BARS			_	H1 BA	RS		H2 BA	RS	A2	BARS			J4	BARS				нз ва	RS	B1	BARS	B:	BARS	_
FILL	TS	BS	TX	ΤI	SIZE	SPA.	SIZE	SPA.	C1	HT=5'	K2 HT=6'	HT=7'	SIZE	SPA.	C5	SIZE	SPA.	C6	SIZE	SPA.	SIZE	SPA.	C4	HT=5'	K3 HT=6'	HT=7'	SIZE	SPA.	C7	SIZE	SPA.	SIZE	SPA.	G1
1 FT	13	9	8	8	5	6.5	4	7.5	45.3	29.0	29.0	29.0	5	17	89.5	5	17	28.5	4	6	4	6	47.3	65	77	89	5	6	44.0	5	12	5		12
2 FT	13	10	8	8	5	6.5	4	7.5	45.3	29.0	29.0	29.0	5	16	89.5	5	16	27.5	4	6	4	7.5	44.5	66	78	90	5	6.5	44.0	5	12	5		12
4 FT	9	9	8	8	5	8.5	5	6.5	42.1	25.0	25.0	25.0	5	15	59.0	5	15	28.5	5	8	4	6	39.5	65	77	89	6	6.5	46.0	5	11	5		12
6 FT	9	9	8	8	5	8.5	5	6.5	36.9	25.0	25.0	29.0	5	14	47.0	5	14	27.5	5	7.5	5	7	36.5	65	77	89	6	6	45.0	5	12	5		12
8 FT	9	10	8	8	5	8.5	5	6.5	35.6	25.0	25.0	25.0	5	12	44.0	5	12	27.0	5	7.5	4	6.5	34.6	66	78	90	6	6.5	45.0	5	12	5		0
10 FT	10	11	8	8	5	8	5	7.5	34.3	26.0	26.0	26.0	5	12	43.0	5	12	26.5	5	7.5	4	6.5	33.3	67	79	91	6	6.5	44.5	5	12	5		0
12 FT	11	12	8	8	5	7.5	5	8.5	33.0	27.0	27.0	27.0	5	12	42.5	5	12	26.5	5	7	4	6	32.1	68	80	92	6	6.5	44.5	5	12	5		0
14 FT	12	13	8	8	5	7	5	8.5	32.1	28.0	28.0	28.0	5	12	42.0	5	12	26.5	5	6.5	4	6	31.5	69	81	93	6	6.5	44.5	5	12	5		0
16 FT	13	14	8	8	5	6.5	5	8.5	31.5	29.0	29.0	33.0	6	16	44.5	6	16	29.5	5	6.5	5	8.5	31.0	70	82	94	6	6.5	44.5	5	12	5		0
18 FT	13	15	8	8	5	6.5	5	8	31.3	29.0	29.0	33.0	6	15	44.5	6	15	29.5	5	6.5	5	8.5	30.5	71	83	95	6	6.5	44.5	5	12	5		0
20 FT	14	15	8	8	5	6	5	8.5	29.3	30.0	30.0	34.0	6	16	43.5	6	16	29.0	5	6	5	8.5	29.1	71	83	95	6	6.5	44.5	5	12	5		0
22 FT	15	16	8	8	5	6	5	8	34.1	31.0	31.0	35.0	6	15	49.5	6	15	35.0	5	6	5	8	29.1	72	84	96	6	6.5	44.5	5	12	5		0
24 FT	15	17	8	8	6	7.5	5	8	34.3	31.0	31.0	35.0	6	14	49.5	6	14	35.0	5	6	5	7	28.9	73	85	97	6	6.5	44.5	5	12	5	12	0
26 FT	16	18	8	8	6	8	5	7	34.1	32.0	36.0	36.0	6	14	49.0	6	14	35.0	5	6	5	6.5	29.0	74	86	98	6	6.5	44.5	5	12	5		0
28 FT	17	19	8	8	6	7.5	5	6.5	34.0	37.0	37.0	37.0	6	14	49.0	6	14	35.0	5	6	5	6.5	29.1	75	87	99	6	6	44.5	5	12	5		0
30 FT	18	20	8	8	6	7.5	5	6.5	34.0	38.0	38.0	38.0	6	13	48.5	6	13	34.0	6	8.5	5	6	29.3	76	88	100	6	6	44.5	5	12	5		0
32 FT	19	21	8	8	6	7.5	5	6	34.1	39.0	39.0	39.0	6	13	48.0	6	13	33.0	6	8.5	6	7.5	32.5	77	89	101	7	7.5	47.0	5	12	5		0
34 FT	20	21	8	8	6	7.5	6	7.5	38.0	44.0	44.0	44.0	6	12	47.5	6	12	32.5	6	7.5	6	7.5	32.6	77	89	101	7	7.5	47.0	5	12	5		0
36 FT	20	22	8	8	6	7	6	7.5	38.0	44.0	44.0	44.0	6	12	47.5	6	12	33.0	6	8	6	7	32.6	78	90	102	7	7.5	47.0	5	12	5		0
38 FT	21	23	8	8	6	7	6	7	38.1	45.0	45.0	45.0	6	12	47.0	6	12	32.0	6	7.5	6	6.5	32.8	79	91	103	7	7	47.0	5	12	5		0
40 FT	22	24	8	8	6	6.5	6	6.5	38.3	46.0	46.0	46.0	7	15	51.5	7	15	36.0	6	7.5	6	6	33.0	80	92	104	7	7	47.0	5	12	5	-	0
42 FT	22	24	8	8	6	6.5	6	6	38.1	46.0	46.0	46.0	7	15	51.5	7	15	36.5	6	7.5	6	6	33.0	80	92	104	7	7	47.0	5	12	5		0
44 FT	23	25	9	8	6	6.5	6	7	39.0	47.0	47.0	47.0	7	15	50.5	7	15	36.0	6	7.5	6	7	33.5	81	93	105	7	7	47.0	5	12	5		0
46 FT	24	26	9	8	6	6	6	7	39.0	48.0	48.0	48.0	7	15	49.5	7	15	35.5	6	7.5	6	6.5	33.8	82	94	106	7	7	47.0	5	12	5		0
48 FT	24	26	9	8	6	6	6	7	39.0	48.0	48.0	48.0	7	15	49.5	7	15	35.5	6	6.5	6	6.5	33.8	82	94	106	7	6.5	47.0	5	12	5		0
50 FT	25	27	9	8	6	6	6	6.5	39.0	49.0	49.0	49.0	7	15	49.0	7	15	35.5	6	7	6	6.5	34.0	83	95	107	7	6.5	47.0	5	12	5	7.5	0

										SP	AN (S) = 9	FΤ			ΗE	IGHT	(HT)	= 8	3 FT	OR	9 FT	OR 1	O FT										
		MEM									TOP SL	AB BAR	ŝ										BOTT	OM SLA	AB BAR	S					WAL			
DESIGN		THICK	NES:	S	A1	BARS			J3	BARS				H1 BA	RS.		H2 B4	RS	A2	BARS			J4	BARS				H3 B4	RS	B1 8	BARS	B2	2 BARS	ŝ
FILL	TS	BS	тх	ΤI	SIZE	SPA.	SIZE	SPA.	C1	HT=8'	K2 HT=9'	HT=10'	SIZE	SPA.	C5	SIZE	SPA.	C6	SIZE	SPA.	SIZE	SPA.	C4	HT=8'	K3 HT=9'	HT=10	SIZE	SPA.	C7	SIZE	SPA.	SIZE	SPA.	G1
1 FT	13	10	8	8	5	6.5	5	8.5	47.3	29.0	29.0	33.0	5	18	91.5	5	18	29.0	4	6	5	6	69.0	102	114	126	5	6.5	44.5	5	12	5	12	12
2 FT	13	10	8	8	5	6.5	5	8.5	47.3	29.0	29.0	33.0	5	17	91.5	5	17	28.0	5	9	6	7	66.6	102	114	126	5	6	44.0	5	12	5	12	12
4 FT	9	9	8	8	5	8.5	6	7	47.3	29.0	33.0	33.0	5	15	91.5	5	15	29.0	5	7.5	6	6	59.4	101	113	125	6	6	46.0	5	12	5	10.5	12
6 FT	9	10	9	8	5	8.5	5	6	54.1	25.0	25.0	29.0	5	14	48.0	5	14	27.5	5	8	5	6	51.8	102	114	126	6	6.5	45.5	5	12	5	11.5	12
8 FT	9	11	9	8	5	8.5	5	6	48.0	25.0	29.0	29.0	5	13	44.0	5	13	27.0	5	8	5	6	49.3	103	115	127	6	7	45.0	5	12	5	11	0
10 FT	10	11	9	8	5	8	5	6	46.6	26.0	30.0	30.0	5	12	43.0	5	12	26.5	5	7	6	7	50.0	103	115	127	6	6.5	44.5	5	12	5	10	0
12 FT	11	12	9	8	5	7.5	6	7	48.4	31.0	31.0	35.0	5	12	42.0	5	12	26.5	5	7	6	7	49.0	104	116	128	6	6.5	44.5	5	12	5	9.5	0
14 FT	12	13	9	8	5	7	6	7.5	47.4	32.0	32.0	36.0	5	12	41.5	5	12	26.5	5	6.5	6	7	48.1	105	117	129	6	6.5	44.5	5	12	5	8.5	0
16 FT	12	14	9	8	5	7	6	6.5	46.4	32.0	32.0	36.0	6	15	44.5	6	15	29.5	5	6.5	6	7	47.5	106	118	130	6	6.5	44.5	5	12	5	8.5	0
18 FT	13	15	9	8	5	6.5	6	6.5	46.0	33.0	33.0	37.0	6	15	44.0	6	15	29.0	5	6.5	6	7.5	47.3	107	119	131	6	7	44.5	5	12	5	8.5	0
20 FT	14	15	9	8	5	6.5	5	6	40.1	34.0	34.0	34.0	6	16	43.0	6	16	29.0	5	6	6	7.5	44.4	107	119	131	6	6.5	44.5	5	12	5	8.5	0
22 FT	14	16	10	8	5	6	5	6	40.5	34.0	34.0	34.0	6	15	43.0	6	15	29.0	5	6	5	7	41.5	108	120	132	6	6.5	44.5	5	12	5	8	0
24 FT	15	17	10	8	6	- 8	6	8	49.5	35.0	35.0	35.0	6	15	48.5	6	15	35.0	5	6	5	6.5	41.6	109	121	133	6	6.5	44.5	5	12	5	8	0
26 FT	16	18	11	8	6	8	5	6	46.1	36.0	36.0	36.0	6	15	48.0	6	15	34.5	5	6	5	7	41.9	110	122	134	6	6.5	44.5	5	12	5	7.5	0
28 FT	17	19	11	8	6	8	6	8	50.1	37.0	37.0	37.0	6	14	47.5	6	14	33.5	5	6	5	7	42.0	111	123	135	6	6	44.5	5	12	5	7.5	0
30 FT	18	20	12	8	6	- 8	5	6	46.8	38.0	38.0	38.0	6	13	47.0	6	13	32.5	6	8.5	5	6.5	42.4	112	124	136	6	6	44.5	5	12	5	7.5	0
32 FT	18	21	12	8	6	7.5	6	8	50.8	38.0	38.0	38.0	6	13	47.0	6	13	33.5	6	8	5	6.5	42.5	113	125	137	7	7.5	47.5	5	12	5	_7_	0
34 FT	19	22	12	8	6	7	6	7.5	50.9	39.0	39.0	39.0	6	13	46.0	6	13	32.5	6	8	5	6.5	42.8	114	126	138	7	7.5	47.5	5	12	5	1	0
36 FT	20	23	13	8	6	1	6	8	51.5	40.0	40.0	40.0	6	12	45.0	6	12	31.5	6	8	5	6	43.1	115	127	139	-		47.5	5	12	5	6.5	0
38 FT	20	23	13	8	6	6.5	6	7.5	51.4	40.0	40.0	40.0	6	12	45.0	6	12	32.0	6	7.5	5	6	43.0	115	127	139	-		47.5	5	12	5	6.5	0
40 FT 42 FT	21	24	13	8	6	6.5	6	7.5	51.5	41.0	41.0	41.0	6	12	44.5	6	12	31.0	6	1.5	5	6	43.3	116	128	140	1 7	1 7	47.5	5	12	5	6.5	0
		25	14	8	6	6	6	1.5			41.0	41.0	6	12	44.5	7	12		6	7.5	5	6			129	141	1 7	6 5	47.5	5	12	5	6	0
44 FT	22	25	14	8	6	6.5	6	 '	52.1	42.0	42.0	42.0	-	16	49.0		16	35.5	6	6.5	5	6	43.6	117	129	141	1 7	6.5	47.5	5	12	5	6	0
46 FT	23	26	15	8	6	6	6	1 4	52.1	43.0	43.0	43.0	6	12	43.5	6	12	30.0	6	1 4	6	8.5	47.1	118	131	142	1 7	6.5	47.5	5	12	5	6	0
50 FT	24	28	15	8	6	6	6	1 4	53.0	44.0	44.0	48.0	_	12	43.0	6	12	30.0	٥	1 4	6	8.5	47.5	120	132	144	1 7	6.5	47.5	5	12	6	8	0
[30 F]	24	28	15	٥	٥	٥١	ם ו		22.0	44.0	44.0	40.0	6	12	43.0	١ ٥	12	1 20.0	٥		1 6	1 8	41.5	120	132	144		10.5	41.5	1 3	_ 12_	٥١	_ 6 _	U



SPECIAL DESIGNS ARE REQUIRED WHEN THE DESIGN FILL IS LESS THAN 1 FOOT OR GREATER THAN 50 FEET.

DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.

DESIGN FILLS ARE MEASURED FROM THE TOP OF TOP SLAB TO THE TOP OF EARTH FILL OR ROADWAY.

CULVERTS MEET STRENGTH AND SERVICEABILITY REQUIREMENTS FOR THE DESIGN VEHICULAR LIVE LOAD HL-93 MINUS THE LANE LOAD.



MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)



CONCRETE DOUBLE BOX CULVERT

MEMBER THICKNESS BAR SIZE, SPACING & DIMENSIONS

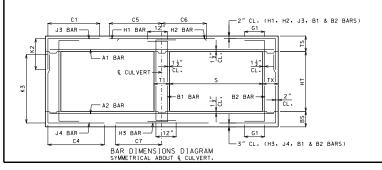
SPAN (S): 9 FEET HEIGHT (HT): 5 THRU 10 FEET

DATE EFFECTIVE: DATE PREPARED: 9/8/2011

703.47

SHEET NO. 12 OF 27

										SPA			9 FT			HE	IGHT	(HT) = 1	1 F											
	١	MEM									SLAB	_									E	MOTTO		BARS					WAL		
DESIGN		THICK	NE SS	•	A1	BARS			J3 BA				H1 BA	RS		H2 BA	RS	A2	BARS			J4 BA				нз ва	RS	B1 E	3ARS	B2	BARS
FILL	TS	BS	ΤX	ΤĮ	SIZE	SPA.	SIZE	SPA.	C1	HT=11'	2 HT=12	SIZE	SPA.	C5	SIZE	SPA.	C6	SIZE	SPA.	SIZE	SPA.	C4	HT=11	3 HT=12′	SIZE	SPA.	C7	SIZE	SPA.	SIZE	SPA. G1
1 FT	13	10	9	10	5	6.5	5	8	48.3	33.0	33.0	5	17	93.0	5	17	29.0	5	9	6	6.5	79.4	138	150	5	6	44.5	5	12	5	9.5 12
2 FT	13	11	9	10	5	6.5	5	7.5	48.3	33.0	33.0	5	16	93.0	5	16	28.0	4	6	6	7	77.0	139	151	5	6	44.5	5	12	5	9 12
4 FT	9	10	9	10	5	8.5	5	6	48.3	29.0	29.0	5	15	93.0	5	15	29.0	5	8	6	6	71.4	138	150	6	7	46.5	5	12	5	8.5 12
6 FT	9	11	9	10	5	8.5	6	7	69.3	29.0	33.0	5	15	47.0	5	15	28.0	5	8.5	6	6	68.0	139	151	5	6	43.0	5	12	5	8.5 12
8 FT	9	11	9	10	5	8.5	6	6.5	61.6	29.0	33.0	5	13	44.0	5	13	27.5	5	7.5	ø	6	63.8	139	151	ø	7	45.5	5	12	5	8.5 0
10 FT	10	11	10	10	5	8	5	6	56.4	30.0	30.0	5	13	43.0	5	13	27.5	5	7	ø	6	60.1	139	151	ø	6.5	45.0	5	12	5	8 0
12 FT	11	12	10	10	5	7.5	5	6	55.0	31.0	31.0	5	13	42.5	5	13	27.0	5	6.5	ø	6.5	59.1	140	152	ø	6.5	45.0	5	12	5	8 0
14 FT	11	13	10	10	5	7.5	6	7	55.6	31.0	35.0	6	16	45.0	6	16	30.0	5	6.5	6	6.5	58.5	141	153	6	6.5	45.0	5	12	5	8 0
16 FT	12	14	11	10	5	7	6	8.5	54.6	32.0	36.0	6	16	44.5	6	16	30.0	5	6.5	6	7	57.4	142	154	6	6.5	45.0	5	12	5	7.5 0
18 FT	13	15	11	10	5	6.5	6	7.5	54.6	33.0	37.0	6	16	44.0	6	16	30.0	5	6.5	6	6.5	57.1	143	155	6	7	44.5	5	12	5	7.5 0
20 FT	13	15	11	10	5	6.5	6	7.5	51.5	33.0	37.0	6	15	43.5	6	15	29.5	5	6	6	6.5	53.4	143	155	6	6.5	44.5	5	12	5	7.5 0
22 FT	14	16	12	10	5	6	6	8	51.9	34.0	38.0	6	16	43.0	6	16	29.5	5	6	6	7.5	53.6	144	156	6	6.5	44.5	5	12	5	7 0
24 FT	15	17	12	10	5	6	6	7.5	58.0	35.0	39.0	6	16	48.5	6	16	35.5	5	6	6	7.5	53.8	145	157	6	6.5	44.5	5	12	5	7 0
26 FT	16	18	13	10	6	8.5	6	7.5	58.5	36.0	40.0	6	15	48.0	6	15	34.5	5	6	6	8	54.0	146	158	6	6.5	44.5	5	12	5	6.5 0
28 FT	17	19	13	10	6	8	6	7	58.6	37.0	41.0	6	14	47.5	6	14	33.5	6	8.5	6	8	54.1	147	159	6	6	44.5	5	12	5	6.5 0
30 FT	17	20	13	10	6	7.5	6	6.5	58.5	37.0	41.0	6	14	47.5	6	14	34.5	6	8	6	7	54.4	148	160	6	6	44.5	5	12	5	6.5 0
32 FT	18	21	14	10	6	7.5	6	7	59.1	38.0	42.0	6	13	47.0	6	13	33.5	6	8	6	8	54.6	149	161	7	7.5	47.5	5	12	5	6 0
34 FT	19	22	14	10	6	7.5	6	6.5	59.3	39.0	43.0	6	13	46.5	6	13	32.5	6	8	6	8	54.9	150	162	7	7.5	47.5	5	12	5	6 0
36 FT	19	22	15	10	6	7	6	6.5	59.5	43.0	43.0	6	13	46.0	6	13	33.0	6	7	6	8	54.9	150	162	7	7.5	48.0	5	12	6	8 0
38 FT	20	23	15	10	6	7	6	6.5	59.6	44.0	44.0	6	12	45.5	6	12	32.0	6	7.5	6	8	55.1	151	163	7	7	47.5	5	12	6	8 0
40 FT	20	24	16	10	6	6	6	6.5	60.0	44.0	44.0	6	12	45.0	6	12	32.5	6	7.5	6	7.5	55.5	152	164	7	7	48.0	5	12	6	8 0
42 FT	21	25	16	10	6	6.5	6	6	60.3	45.0	45.0	6	12	44.5	6	12	31.5	6	7.5	6	7.5	55.8	153	165	7	7	48.0	5	12	6	8 0
44 FT	22	25	17	10	6	6.5	6	6.5	60.8	46.0	46.0	6	12	44.0	6	12	31.0	6	6.5	6	7	55.9	153	165	7	6.5	48.0	5	12	6	7.5 0
46 FT	22	26	17	10	6	6	6	6	60.8	46.0	46.0	6	12	44.0	6	12	31.0	6	7	6	7	56.1	154	166	7	6.5	48.0	5	12	6	7.5 0
48 FT	23	27	18	10	6	6	6	6.5	61.5	47.0	47.0	6	12	43.5	6	12	31.0	6	7	6	6.5	56.6	155	167	7	6.5	48.0	5	12	6	7 0
50 FT	23	28	19	10	6	6	6	6.5	62.0	43.0	47.0	6	12	43.5	6	12	31.0	6	7	6	7	57.0	156	168	7	6.5	48.0	5	12	6	7 0



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MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)



CONCRETE DOUBLE BOX CULVERT

MEMBER THICKNESS BAR SIZE, SPACING & DIMENSIONS

SPAN (S): 9 FEET HEIGHT (HT): 11 THRU 12 FEET

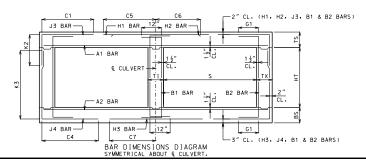
DATE EFFECTIVE: DATE PREPARED: 9/8/2011

703.47

SHEET NO. 13 OF 27

										SP.	AN (S) = 1	0 F	T		HE	IGH	Г (НТ) =	5 F1	r or	6 F	T OR	7 FT										_
		MEN	BER								TOP SL	AB BAR	5										BOTT	OM SLA	AB BAR	S					WAL	L BAI	RS	_
DESIGN		THIC	KNES	S	A1	BARS			J:	BARS				H1 BA	RS.		H2 BA	RS	A2	BARS			J4	BARS				нз ва	RS	B1	BARS	B2	2 BARS	;
FILL	TS	BS	тх	ΤI	SIZE	SPA.	SIZE	SPA.	C1	HT=5'	K2 HT=6'	HT=7'	SIZE	SPA.	C5	SIZE	SPA.	C6	SIZE	SPA.	SIZE	SPA.	C4	HT=5'	K3 HT=6'	HT=7'	SIZE	SPA.	C7	SIZE	SPA.	SIZE	SPA.	G 1
1 FT	13	10	8	8	5	6.5	4	7	48.9	29.0	29.0	29.0	5	15	98.0	5	15	29.0	4	6	4	7	48.1	66	78	90	5	6	47.5	5	12	5	12	12
2 FT	13	10	8	8	5	6.5	4	7	48.9	29.0	29.0	29.0	5	13	98.0	5	13	28.5	5	8.5	4	6.5	43.8	66	78	90	6	7	50.0	5	12	5	12	12
4 FT	9	10	8	8	5	7.5	6	7.5	43.1	25.0	25.0	25.0	5	12	62.0	5	12	30.0	5	8	4	7	38.9	66	78	90	6	6.5	49.5	5	8.5	5	12	12
6 FT	9	10	8	8	5	8.5	5	6	38.0	25.0	25.0	25.0	6	15	53.5	6	15	32.0	5	7	4	6.5	36.1	66	78	90	6	6	48.5	5	12	5	12	12
8 FT	10	11	8	8	5	8	5	7.5	36.0	26.0	26.0	26.0	6	16	51.0	6	16	31.5	5	7	4	6.5	34.1	67	79	91	6	6	48.0	5	12	5	12	0
10 FT	11	12	8	8	5	7.5	5	8	34.1	27.0	27.0	27.0	6	15	49.5	6	15	31.0	5	6.5	4	6	32.6	68	80	92	6	6.5	48.0	5	12	5	12	0
12 FT	12	13	8	8	5	7	5	8.5	32.8	28.0	28.0	28.0	6	15	48.5	6	15	31.0	5	6.5	4	6	31.5	69	81	93	6	6.5	48.0	5	12	5	12	0
14 FT	13	14	8	8	5	6.5	5	8.5	31.6	29.0	29.0	33.0	6	15	48.5	6	15	31.0	5	6	5	9	30.8	70	82	94	6	6	47.5	5	12	5	12	0
16 FT	14	15	8	8	5	6	5	8.5	30.8	30.0	30.0	34.0	6	14	48.0	6	14	31.0	5	6	5	8.5	30.1	71	83	95	6	6	47.5	5	12	5	12	0
18 FT	15	16	8	8	6	8	5	8	35.1	31.0	31.0	35.0	6	14	53.5	6	14	36.5	6	8	5	8	29.9	72	84	96	6	6	47.5	5	12	5	12	0
20 FT	15	17	8	8	6	7.5	5	8	35.1	31.0	31.0	35.0	6	13	53.5	6	13	36.5	6	8	5	7	29.4	73	85	97	6	6	47.5	5	12	5	12	0
22 FT	16	18	8	8	6	8	5	7	33.4	32.0	36.0	36.0	6	13	52.5	6	13	36.5	6	8	5	6.5	28.0	74	86	98	6	6.5	47.5	5	12	5		0
24 FT	17	19	8	8	6	7.5	5	6.5	33.3	37.0	37.0	37.0	6	13	52.5	6	13	36.5	6	8	5	6.5	28.0	75	87	99	6	6	47.5	5	12	5	12	0
26 FT	18	20	8	8	6	7	5	6.5	33.1	38.0	38.0	38.0	6	13	52.0	6	13	36.5	6	8	5	6	28.1	76	88	100	6	6	47.5	5	12	5		0
28 FT	19	21	8	8	6	7	5	6	33.1	39.0	39.0	39.0	6	13	52.0	6	13	36.0	6	7.5	6	7.5	31.3	77	89	101	7	7.5	50.5	5	12	5		0
30 FT	20	22	8	8	6	7	6	7.5	37.1	44.0	44.0	44.0	6	12	51.5	6	12	35.5	6	7.5	6	7	31.4	78	90	102	7	7.5	50.5	5	12	5		0
32 FT	21	23	8	8	6	6.5	6	7	37.1	45.0	45.0	45.0	6	12	51.0	6	12	34.5	6	7.5	6	6.5	31.5	79	91	103	7	7	50.5	5	12	5		0
34 FT	22	23	8	8	6	6.5	6	6.5	37.0	46.0	46.0	46.0	7	15	55.5	7	15	38.5	6	6.5	6	6.5	31.6	79	91	103	7	7	50.5	5	12	5		0
36 FT	22	24	8	8	6	6	6	6.5	37.1	46.0	46.0	46.0	7	15	55.5	7	15	39.5	6	7	6	6	31.6	80	92	104	7	7	50.0	5	12	5		0
38 FT	23	25	8	8	6	6	6	6	37.1	47.0	47.0		7	15	55.0	7	15	38.5	6	7	6	6	31.9	81	93	105	7	6.5	50.0	5	12	5		0
40 FT	24	26	9	8	6	6	6	7	38.0	48.0	48.0	48.0	7	14	54.0	7	14	37.5	6	7	6	6.5	32.5	82	94	106	7	6.5	50.0	5	12	5		0
42 FT	25	27	9	8	6	6	6	6.5	38.0	49.0	49.0	49.0	7	14	53.5	7	14	37.0	6	7	6	6.5	32.6	83	95	107	7	6	50.0	5	12	5		0
44 FT	25	28	9	8	7	7.5	6	6.5	38.1	49.0	49.0	49.0	7	14	53.0	7	14	37.5	6	6.5	6	6	32.8	84	96	108	7	6	50.0	5	12	5		0
46 FT	26	28	9	8	7	7.5	6	6.5	38.1	50.0	50.0	50.0	7	13	52.5	7	13	36.5	6	6.5	6	6	32.9	84	96	108	7	6	50.0	5	12	5		0
48 FT	27	29	9	8	7	7.5	6	6	38.1	51.0	51.0	51.0	7	14	51.5	7	14	36.5	6	6.5	6	6	33.0	85	97	109	7	6	50.0	5	12	5		0
50 FT	27	30	10	8	7	7	6	7	39.0	51.0	51.0	51.0	7	13	51.5	7	13	36.0	6	6.5	6	6.5	33.5	86	98	110	7	6	50.0	5	12	5	8	0

										SP	AN (S) = 1	0 F	T		HE	I GH	Г (НТ) =	8 FT	OR	9 F	T OR	10 F	Γ									
		MEM	BER								TOP SL	AB BARS	ŝ										BOTT	OM SLA	AB BAR	ŝ					WAL	L BA	RS	
DESIGN		THIC	(NES	5	Α1	BARS			J3	BARS				H1 BA	\RS		H2 BA	RS	A2	BARS			J4	BARS				нз ва	RS	B1 8	BARS	B2	2 BARS	ŝ
FILL	TS	BS	тх	ΤI	SIZE	SPA.	SIZE	SPA.	C1	HT=8'	K2 HT=9'	HT=10'	SIZE	SPA.	C5	SIZE	SPA.	C6	SIZE	SPA.	SIZE	SPA.	C4	HT=8'	K3 HT=9'	HT=10'	SIZE	SPA.	C7	SIZE	SPA.	SIZE	SPA.	G1
1 FT	13	10	8	8	5	6.5	5	8.5	50.9	29.0	33.0	33.0	5	14	100.0	5	14	29.5	5	8.5	6	7.5	71.6	102	114	126	5	6	47.5	5	12	5	12	12
2 FT	13	11	8	8	5	6.5	5	8.5	50.9	29.0	33.0	33.0	5	13	100.0	5	13	28.5	5	8.5	5	6	64.1	103	115	127	5	6	47.0	5	12	5	12	12
4 FT	9	10	9	8	5	7.5	5	6	69.0	25.0	25.0	29.0	5	12	73.0	5	12	30.0	5	7.5	5	6	55.4	102	114	126	6	6.5	49.5	5	10	5	12	12
6 FT	9	10	9	8	5	8.5	5	6	51.4	25.0	29.0	29.0	6	15	54.0	6	15	32.0	5	7	6	7	53.4	102	114	126	6	6	48.5	5	12	5	12	12
8 FT	10	11	9	8	5	8	5	6	48.0	26.0	30.0	30.0	5	12	48.0	5	12	28.5	5	7	6	7.5	50.9	103	115	127	6	6	48.0	5	12	5	11.5	0
10 FT	11	12	9	8	5	7.5	5	6	46.0	31.0	31.0	31.0	6	16	49.5	6	16	31.0	5	6.5	5	6	46.3	104	116	128	6	6	48.0	5	12	5	10.5	0
12 FT	12	13	9	8	5	7	5	6	44.5	32.0	32.0	32.0	6	15	48.5	6	15	31.0	5	6.5	5	6	45.0	105	117	129	6	6	47.5	5	12	5	9.5	0
14 FT	13	14	9	8	5	6.5	5	6	43.3	33.0	33.0	33.0	6	15	48.0	6	15	30.5	5	6	5	6	43.9	106	118	130	6	6	47.5	5	12	5	8.5	0
16 FT	14	15	9	8	5	6	5	6	42.1	34.0	34.0	34.0	6	15	47.5	6	15	30.5	5	6	5	6	43.0	107	119	131	6	6	47.5	5	12	5	8.5	0
18 FT	15	16	10	8	6	8.5	5	6.5	47.1	35.0	35.0	35.0	6	15	53.0	6	15	36.5	6	8	5	7	42.8	108	120	132	6	6	47.5	5	12	5	8.5	0
20 FT	15	17	10	8	6	8	6	8	50.6	35.0	35.0	35.0	6	13	52.5	6	13	36.5	6	8	5	6.5	42.3	109	121	133	6	6	47.5	5	12	5	8	0
22 FT	16	18	10	8	6	8	5	6	44.5	36.0	36.0	36.0	6	14	52.0	6	14	36.0	6	8	5	7	40.0	110	122	134	6	6.5	47.5	5	12	5	8	0
24 FT	17	19	10	8	6	7.5	6	8	48.4	37.0	37.0	37.0	6	14	51.5	6	14	36.0	6	8	5	6.5	40.1	111	123	135	6	6	47.5	5	12	5	8	0
26 FT	18	20	11	8	6	7.5	5	6	45.0	38.0	38.0	38.0	6	13	51.0	6	13	35.5	6	7.5	5	7	40.5	112	124	136	6	6	47.5	5	12	5	7.5	0
28 FT	19	21	11	8	6	7	6	8	49.0	39.0	39.0	39.0	6	13	50.5	6	13	35.0	6	7.5	5	7	40.5	113	125	137	7	7.5	50.5	5	12	5	7.5	0
30 FT	19	22	12	8	6	6.5	6	8	49.8	39.0	39.0	39.0	6	13	50.0	6	13	35.5	6	7.5	5	6.5	40.9	114	126	138	7	7.5	50.5	5	12	5	7.5	0
32 FT	20	23	12	8	6	6.5	6	8	49.6	40.0	40.0	40.0	6	12	49.5	6	12	34.5	6	7.5	5	6.5	41.0	115	127	139	7	7	50.5	5	12	5	7	0
34 FT	21	24	12	8	6	6.5	6	7.5	49.6	41.0	41.0	41.0	6	12	49.0	6	12	33.5	6	7.5	5	6.5	41.1	116	128	140	7	7	50.5	5	12	5	7	0
36 FT	22	25	12	8	6	6.5	6	6.5	49.6	42.0	42.0	42.0	7	15	53.0	7	15	38.0	6	7	5	6.5	41.3	117	129	141	7	6.5	50.5	5	12	5	7	0
38 FT	23	26	13	8	6	6	6	7.5	50.4	43.0	43.0	43.0	7	15	52.0	7	15	37.0	6	7	5	6	41.8	118	130	142	7	6.5	50.5	5	12	5	6.5	0
40 FT	23	26	13	8	6	6	6	7	50.3	43.0	43.0	43.0	7	15	52.0	7	15	37.5	6	6.5	5	6	41.6	118	130	142	7	6.5	50.5	5	12	5	6.5	0
42 FT	24	27	14	8	6	6	6	7.5	51.0	44.0	44.0	44.0	7	14	51.5	7	14	36.5	6	6.5	5	6	42.1	119	131	143	7	6	50.5	5	12	5	6	0
44 FT	24	28	14	8	7	7	6	7	51.1	44.0	44.0	44.0	7	14	51.5	7	14	37.0	6	6.5	5	6	42.1	120	132	144	7	6	50.5	5	12	5	6	0
46 FT	25	29	14	8	7	7.5	6	6.5	51.1	45.0	49.0	49.0	7	14	51.0	7	14	36.0	6	6.5	6	8.5	45.4	121	133	145	7	6	50.5	5	12	5	6	0
48 FT	26	30	14	8	7	7	6	6	51.1	46.0	50.0	50.0	7	15	50.5	7	15	36.0	6	6.5	6	8	45.6	122	134	146	7	6	50.5	5	12	5	6	0
50 FT	26	30	15	8	7	7	6	6.5	51.9	50.0	50.0	50.0	7	14	50.5	7	14	36.0	6	6	6	8	45.8	122	134	146	8	7.5	56.5	5	12	6	8	0



SPECIAL DESIGNS ARE REQUIRED WHEN THE DESIGN FILL IS LESS THAN 1 FOOT OR GREATER THAN 50 FEET.

DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.

DESIGN FILLS ARE MEASURED FROM THE TOP OF TOP SLAB TO THE TOP OF EARTH FILL OR ROADWAY.

CULVERTS MEET STRENGTH AND SERVICEABILITY REQUIREMENTS FOR THE DESIGN VEHICULAR LIVE LOAD HL-93 MINUS THE LANE LOAD.



MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION



CONCRETE DOUBLE BOX CULVERT

MEMBER THICKNESS BAR SIZE, SPACING & DIMENSIONS

SPAN (S): 10 FEET HEIGHT (HT): 5 THRU 10 FEET

DATE EFFECTIVE: DATE PREPARED:

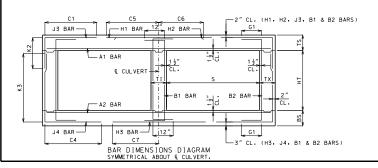
9/8/2011

703.47

SHEET NO. 14 OF 27

105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)

										SPA	N (S)	= 10	FΤ			HE!	GHT	(HT)	= 1	1 FT	OR	12	FT OF	₹ 13 F	Т								
			BER								TOP SL.	AB BAR												OM SLA	B BARS	5					WAL		
DESIGN		THIC	KNES:	5	A1	BARS			J3	BARS				H1 BA	RS		H2 BA	RS	A2	BARS			J4	BARS				H3 BA	RS	B1 I	BARS	B2	BARS
FILL	TS	BS	тх	ΤI	SIZE	SPA.	SIZE	SPA.	C1	HT=11	K2 'HT=12'	HT=13'	SIZE	SPA.	C5	SIZE	SPA.	C6	SIZE	SPA.	SIZE	SPA.	C4	HT=111	K3 HT=12'	HT=13′	SIZE	SPA.	C7	SIZE	SPA.	SIZE	SPA. G1
1 FT	13	10	9	10	5	6.5	5	6.5	51.9	33.0	33.0	33.0	5	14	101.0	5	14	30.0	5	7.5	6	6	85.4	138	150	162	6	7	51.0	5	12	5	8.5 12
2 FT	13	11	9	10	5	6.5	5	6	51.9	33.0	33.0	33.0	5	13	101.0	5	13	29.0	5	8	6	6	82.6	139	151	163	5	6	47.5	5	12	5	8.5 12
4 FT	9	10	10	10	5	7.5	6	7	52.5	29.0	29.0	33.0	5	12	101.5	5	12	30.5	5	7	6	6	74.5	138	150	162	6	6	50.0	5	10	5	8 12
6 FT	9	11	10	10	5	8.5	6	7	70.4	29.0	29.0	33.0	5	12	50.5	5	12	29.5	5	7	6	6	71.0	139	151	163	6	6.5	49.5	5	12	5	8 12
8 FT	10	12	11	10	5	8	5	6	62.6	30.0	30.0	30.0	5	12	47.5	5	12	29.0	5	7	5	6	64.6	140	152	164	6	6.5	48.5	5	12	5	7.5 0
10 FT	11	12	11	10	5	7.5	5	6.5	60.9	31.0	31.0	31.0	5	12	46.5	5	12	28.5	5	6.5	6	6.5	64.4	140	152	164	6	6	48.0	5	12	5	7.5 0
12 FT	11	13	11	10	5	7.5	6	7.5	60.6	31.0	31.0	35.0	6	15	48.5	6	15	31.5	5	6	6	6.5	63.6	141	153	165	6	6	48.0	5	12	5	7.5 0
14 FT	12	14	11	10	5	7	6	7.5	59.6	32.0	32.0	36.0	6	14	48.0	6	14	31.5	5	6	6	6.5	62.5	142	154	166	6	6	48.0	5	12	5	7.5 0
16 FT	13	15	12	10	5	6.5	6	7.5	58.4	33.0	33.0	37.0	6	14	47.5	6	14	31.0	6	8	6	7	61.1	143	155	167	6	6	48.0	5	12	5	7 0
18 FT	14	16	12	10	5	6	6	7	58.0	34.0	38.0	38.0	6	14	47.0	6	14	31.0	6	8	6	6.5	60.5	144	156	168	6	6.5	48.0	5	12	5	7 0
20 FT	15	17	13	10	6	8	6	7	64.0	35.0	39.0	39.0	6	14	52.5	6	14	37.0	6	8	6	6.5	59.9	145	157	169	6	6.5	48.0	5	12	5	6.5 0
22 FT	15	18	13	10	6	7.5	6	7	61.1	35.0	35.0	39.0	6	13	52.0	6	13	37.0	6	8	6	7.5	57.4	146	158	170	6	6.5	48.0	5	12	5	6.5 0
24 FT	16	19	13	10	6	7.5	6	6.5	61.3	36.0	36.0	40.0	6	13	51.5	6	13	36.5	6	7.5	6	7.5	57.4	147	159	171	6	6	48.0	5	12	5	6.5 0
26 FT	17	20	14	10	6	7.5	6	7	61.8	37.0	37.0	41.0	6	13	51.5	6	13	36.5	6	7.5	6	7.5	57.6	148	160	172	6	6	48.0	5	12	5	6 0
28 FT	18	21	14	10	6	7	6	6.5	61.9	38.0	38.0	42.0	6	13	51.0	6	13	36.5	6	7.5	6	7.5	57.8	149	161	173	7	7.5	51.0	5	12	5	6 0
30 FT	19	22	15	10	6	7	6	6.5	62.4	39.0	43.0	43.0	6	13	50.0	6	13	35.5	6	7.5	ø	7.5	58.0	150	162	174	7	7.5	51.0	5	12	6	8 0
32 FT	20	23	15	10	6	7	6	6	62.5	44.0	44.0	44.0	6	12	49.5	6	12	34.5	6	7	ø	7.5	58.1	151	163	175	7	7	51.0	5	12	6	8 0
34 FT	21	24	16	10	6	6.5	6	6.5	63.0	41.0	45.0	45.0	6	12	48.5	6	12	33.5	6	7	6	7.5	58.5	152	164	176	7	7	51.0	5	12	6	8 0
36 FT	21	25	16	10	6	6	6	6	62.9	45.0	45.0	45.0	6	12	48.5	6	12	34.0	6	7	6	7.5	58.6	153	165	177	7	6.5	51.0	5	12	6	8 0
38 FT	22	26	17	10	6	6.5	6	6	63.5	42.0	46.0	46.0	7	15	52.5	7	15	38.5	6	7	6	7	59.0	154	166	178	7	6.5	51.0	5	12	6	7.5 0
40 FT	23	26	17	10	6	6	6	6	63.5	47.0	47.0	47.0	7	15	52.0	7	15	37.5	6	6	6	7	58.9	154	166	178	7	6.5	51.0	5	12	6	7.5 0
42 FT	24	27	18	10	6	6	6	6	64.1	44.0	48.0	48.0	7	15	51.5	7	15	37.0	6	6.5	6	6.5	59.3	155	167	179	7	6	51.0	5	12	6	7 0
44 FT	24	28	19	10	7	8	6	6	64.6	44.0	48.0	48.0	7	14	51.5	7	14	37.0	6	6.5	6	6.5	59.6	156	168	180	7	6	51.0	5	12	6	7 0
46 FT	25	29	19	10	7	7.5	6	6	64.8	49.0	49.0	49.0	7	15	51.0	7	15	36.5	6	6.5	6	6.5	59.9	157	169	181	7	6	51.0	5	12	6	6.5 0
48 FT	25	30	20	10	7	7.5	7	8	70.3	49.0	49.0	49.0	7	15	51.0	7	15	36.5	6	6.5	6	6.5	60.3	158	170	182	7	6	51.0	5	12	6	6.5 0
50 FT	26	31	20	10	7	7	7	7	70.4	50.0	50.0	50.0	7	15	50.5	7	15	36.5	6	6	6	6	60.5	159	171	183	7	6	51.0	5	12	6	6.5 0



SPECIAL DESIGNS ARE REQUIRED WHEN THE DESIGN FILL IS LESS THAN 1 FOOT OR GREATER THAN 50 FEET.

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DESIGN FILLS ARE MEASURED FROM THE TOP OF TOP SLAB TO THE TOP OF EARTH FILL OR ROADWAY.

CULVERTS MEET STRENGTH AND SERVICEABILITY REQUIREMENTS FOR THE DESIGN VEHICULAR LIVE LOAD HL-93 MINUS THE LANE LOAD.



MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

SHEET NO.

105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)



CONCRETE DOUBLE BOX CULVERT

MEMBER THICKNESS BAR SIZE, SPACING & DIMENSIONS

SPAN (S): 10 FEET HEIGHT (HT): 11 THRU 13 FEET

DATE EFFECTIVE: DATE PREPARED:

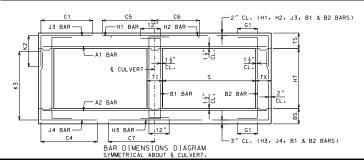
9/8/2011

703.47

15 OF 27

										SP.) = 1		T		HE	IGH	Г (НТ) =	6 FT	OR	7 F	T OR	8 FT										
		MEM									TOP SL.	AB BARS												roM SLA	B BARS	5					WAL			
DESIGN		THICH	(NES	5	A1	BARS			J3	BARS				H1 BA	RS		H2 BA	RS	A2	BARS			J4	BARS				H3 BA	RS	B1 E	BARS	B2	2 BARS	5
FILL	TS	BS	ТX	ΤI	SIZE	SPA.	SIZE	SPA.	C1	HT=6'	K2 HT=7'	HT=8'	SIZE	SPA.	C5	SIZE	SPA.	C6	SIZE	SPA.	SIZE	SPA.	C4	HT=6'	K3 HT=7'	HT=8'	SIZE	SPA.	C7	SIZE	SPA.	SIZE	SPA.	G1
1 FT	14	10	8	8	5	6	4	6.5	52.5	30.0	30.0	30.0	5	13	106.5	5	13	30.0	5	8	5	7	52.9	78	90	102	6	7	53.5	5	12	5	12	12
2 FT	14	11	8	8	5	6	4	6	52.5	30.0	30.0	30.0	5	12	106.5	5	12	29.0	5	8	5	8	49.1	79	91	103	6	7	53.0	5	12	5	12	12
4 FT	10	10	8	8	5	7	5	6	45.6	26.0	26.0	30.0	6	16	72.5	6	16	35.0	5	7	5	6.5	43.0	78	90	102	6	6	52.5	5	10.5	5	12	12
6 FT	10	11	8	8	5	7.5	5	6	40.8	26.0	26.0	30.0	6	15	58.5	6	15	33.5	5	6.5	5	7.5	39.5	79	91	103	6	6	52.0	5	12	5	12	12
8 FT	11	12	8	8	5	7.5	5	7	38.6	27.0	27.0	31.0	6	15	54.5	6	15	33.0	5	6.5	5	8	37.3	80	92	104	6	6	51.5	5	12	5	12	0
10 FT	12	13	8	8	5	7	5	7.5	36.6	28.0	28.0	32.0	6	14	53.0	6	14	32.5	5	6	5	8	35.6	81	93	105	6	6	51.0	5	12	5	12	0
12 FT	13	14	8	8	5	6.5	5	7.5	35.3	29.0	33.0	33.0	6	14	52.0	6	14	32.5	6	8.5	5	8.5	34.6	82	94	106	6	6	51.0	5	12	5	12	0
14 FT	14	15	8	8	5	6	5	8	34.1	30.0	34.0	34.0	6	13	51.5	6	13	32.0	6	8	5	8.5	33.8	83	95	107	6	6	51.0	5	12	5	12	0
16 FT	15	16	8	8	6	8	5	7.5	38.3	31.0	35.0	35.0	6	13	57.0	6	13	38.0	6	7.5	5	8	33.1	84	96	108	6	6	51.0	5	12	5	12	0
	16	17	8	8	6	8	5	7	37.5	32.0	36.0	36.0	6	12	56.5	6	12	38.0	6	7	5	7	32.6	85	97	109	7	7	53.5	5	12	5	10.5	
20 FT	17	18	8	8	6	7.5	5	6.5	37.1	37.0	37.0	37.0	6	12	56.5	6	12	38.0	6	7	5	6.5	32.4	86	98	110	7	7	53.5	5	12	5	9.5	0
22 FT	18	20	8	8	6	7	5	6.5	37.1	38.0	38.0	38.0	6	12	56.0	6	12	37.5	6	7.5	5	6	32.4	88	100	112	6	6	50.5	5	12	5	9.5	0
24 FT	19	20	8	8	6	6.5	5	6	35.1	39.0	39.0	39.0	6	12	55.0	6	12	37.5	6	7	5	6	30.9	88	100	112	6	6	50.5	5	12	5	9.5	0
26 FT	20	21	8	8	6	6.5	6	7.5	39.1	44.0	44.0	44.0	6	12	54.5	6	12	37.5	6	6.5	6	7.5	33.9	89	101	113	7	7	53.5	5	12	5	9.5	0
28 FT	21	22	8	8	6	6.5	6	7	39.1	45.0	45.0	45.0	6	12	54.5	6	12	37.0	6	6	6	7	34.0	90	102	114	7	7	53.5	5	12	5	9.5	0
30 FT	22	23	8	8	6	6	6	6.5	39.1	46.0	46.0	46.0	7	15	59.0	7	15	41.0	6	6	6	6.5	34.1	91	103	115	7	7	53.5	5	12	5	8.5	0
32 FT	23	24	8	8	6	6	6	6	39.1	47.0	47.0	47.0	7	15	58.5	7	15	40.5	6	6	6	6	34.3	92	104	116	7	7	53.5	5	12	5	8	0
34 FT	23	26	9	8	7	7.5	6	7	40.3	47.0	47.0	47.0	7	15	58.0	7	15	41.0	6	6.5	6	6.5	34.8	94	106	118	7	6.5	53.5	5	12	5	8.5	0
36 FT	24	27	9	8	7	7.5	6	7	40.3	48.0	48.0	48.0	7	14	57.5	7	14	40.5	6	6.5	6	6.5	34.9	95	107	119	7	6	53.5	5	12	5	8	0
38 FT	25	27	9	8	7	7.5	6	6.5	40.1	49.0	49.0	49.0	7	14	57.0	7	14	39.5	6	6	6	6.5	35.0	95	107	119	7	6	53.5	5	12	5	7.5	0
40 FT	26	28	10	8	7	7.5	6	7	40.9	50.0	50.0	50.0	7	13	56.0	7	13	38.5	6	6	6	7	35.5	96	108	120	7	6	53.5	5	12	5	8	0
42 FT	27	29	10	8	7	7	6	7	41.0	51.0	51.0	51.0	7	13	55.0	7	13	37.5	6	6	6	6.5	35.8	97	109	121	8	7.5	59.5	5	12	5	8	0
	27	30	11	8	7	6.5	5	6	37.9	47.0	47.0	47.0	7	13	54.5	7	13	38.0	6	6	6	7	36.1	98	110	122	8	7.5	59.5	5	12	5	7.5	0
46 FT	28	31	11	8	7	6.5	6	7.5	41.9	52.0	52.0	52.0	7	12	54.0	7	12	37.5	6	6	6	7	36.4	99	111	123	8	7	59.5	5	12	5	7.5	0
48 FT	29	32	11	8	7	6.5	6	7	41.9	53.0	53.0	53.0	7	12	53.5	7	12	37.0	6	6	6	6.5	36.5	100	112	124	8	7	59.0	5	12	5	7.5	0
50 FT	29	33	11	8	7	6.5	6	7	42.0	53.0	53.0	53.0	7	12	53.5	7	12	37.0	6	6	6	6.5	36.6	101	113	125	8	7	59.0	5	12	5	7	0
ı ——																																		

										SPAI	N (S)	= 11	FΤ			ΗE	IGHT	(HT)	= 9	FT.	OR	10 F	T OR	11 F	T									
		MEM									TOP SL.	AB BAR	S										BOTT	OM SLA	AB BAR	S					WAL	L BA	RS	
DESIGN		THICH	(NES	S	A1	BARS			J3	BARS				H1 BA	\RS		H2 BA	RS	A2	BARS			J4	BARS				нз ва	RS	B1 F	BARS	B2	2 BARS	5
FILL	TS	BS	тх	ΤI	SIZE	SPA.	SIZE	SPA.	C1	HT=9'	K2 HT=10'	HT=11'	SIZE	SPA.	C5	SIZE	SPA.	C6	SIZE	SPA.	SIZE	SPA.	C4	HT=9'	K3 HT=10'	HT=11	SIZE	SPA.	C7	SIZE	SPA.	SIZE	SPA.	G1
1 FT	14	10	8	9	5	6	5	8	54.6	34.0	34.0	34.0	5	13	109.0	5	13	30.5	5	7.5	6	6	76.4	114	126	138	6	6.5	54.0	5	12	5	10	12
2 FT	14	11	8	9	5	6	5	8	54.6	34.0	34.0	34.0	5	12	109.0	5	12	29.5	5	7.5	6	6.5	71.8	115	127	139	6	7	53.5	5	12	5	10	12
4 FT	10	10	9	9	5	7	5	6	82.4	30.0	30.0	30.0	6	16	84.0	6	16	35.0	5	7	6	6.5	62.1	114	126	138	7	7	55.5	5	10.5	5	10	12
6 FT	10	11	9	9	5	7.5	5	6	56.3	30.0	30.0	30.0	6	15	58.5	6	15	33.5	5	6.5	6	6.5	58.1	115	127	139	6	6	52.0	5	12	5	9.5	12
8 FT	11	12	10	9	5	7.5	5	6	52.4	31.0	31.0	31.0	6	15	54.5	6	15	33.0	5	6	5	6	52.1	116	128	140	6	6	51.5	5	12	5	10.5	0
10 FT	11	13	10	9	5	7.5	5	6	49.6	31.0	31.0	31.0	6	14	52.5	6	14	32.5	5	6	5	6	50.5	117	129	141	6	6	51.5	5	12	5	9.5	0
12 FT	12	14	10	9	5	6.5	5	6	48.1	32.0	32.0	32.0	6	13	52.0	6	13	32.5	6	8	5	6	49.0	118	130	142	6	6	51.0	5	12	5	9	0
14 FT	14	15	10	9	5	6	5	6	47.1	34.0	34.0	34.0	6	14	51.5	6	14	32.5	6	8	5	6	47.9	119	131	143	6	6	51.0	5	12	5	8	0
16 FT	15	16	10	9	6	8	6	8	55.0	35.0	35.0	35.0	6	13	57.0	6	13	38.5	6	7.5	5	6	46.9	120	132	144	6	6	51.0	5	12	5	8	0
18 FT	16	17	10	9	6	8	6	7.5	53.9	36.0	36.0	40.0	6	13	56.5	6	13	38.0	6	7	6	7	49.0	121	133	145	6	6	51.0	5	12	5	8	0
20 FT	17	18	11	9	6	7.5	6	8	54.0	37.0	37.0	37.0	6	13	56.0	6	13	38.0	6	6.5	5	6	45.9	122	134	146	6	6	51.0	5	12	5	7.5	0
22 FT	18	20	12	9	6	7	6	8	54.4	38.0	38.0	38.0	6	13	55.5	6	13	38.0	6	7.5	5	6.5	46.0	124	136	148	6	6	51.0	5	12	5	7	0
24 FT	18	20	12	9	6	7	6	8	52.1	38.0	38.0	38.0	6	12	54.5	6	12	37.5	6	6.5	5	6.5	43.5	124	136	148	6	6	51.0	5	12	5	7.5	0
26 FT	19	22	12	9	6	6.5	6	7.5	52.1	39.0	39.0	39.0	6	12	54.5	6	12	37.5	6	7	5	6.5	43.6	126	138	150	7	7.5	54.0	5	12	5	7	0
28 FT	20	23	12	9	6	6.5	6	7	52.1	40.0	40.0	40.0	6	12	54.0	6	12	37.5	6	7	5	6	43.8	127	139	151	7	7	54.0	5	12	5	7	0
30 FT	21	24	13	9	6	6	6	7.5	52.8	41.0	41.0	41.0	6	12	53.0	6	12	37.0	6	6.5	5	6	44.1	128	140	152	7	7	54.0	5	12	5	6.5	0
32 FT	22	25	13	9	6	6	6	7	52.8	42.0	42.0	42.0	7	15	56.5	7	15	41.0	6	6.5	5	6	44.3	129	141	153	7	6.5	54.0	5	12	5	6.5	0
34 FT	23	26	13	9	6	6	6	6.5	52.8	43.0	43.0	43.0	7	15	57.0	7	15	40.0	6	6.5	5	6	44.4	130	142	154	7	6.5	54.0	5	12	5	6.5	0
36 FT	24	27	14	9	7	8	6	7	53.4	44.0	44.0	44.0	7	14	56.0	7	14	39.5	6	6.5	5	6	44.8	131	143	155	7	6	54.0	5	12	5	6	0
38 FT	25	28	14	9	7	7.5	6	7	53.4	45.0	45.0	45.0	7	14	55.0	7	14	38.5	6	6.5	5	6	44.9	132	144	156	7	6	54.0	5	12	5	6	0
40 FT	25	29	14	9	7	7	6	6	53.4	45.0	49.0	49.0	7	14	55.0	7	14	39.0	6	6	6	8.5	47.9	133	145	157	8	7.5	60.0	5	12	5	6	0
42 FT	26	30	15	9	7	7	6	6.5	54.1	50.0	50.0	50.0	7	13	54.0	7	13	38.0	6	6	6	8	48.4	134	146	158	8	7.5	60.0	5	12	6	8	0
44 FT	27	31	15	9	7	7	6	6.5	54.1	51.0	51.0	51.0	7	13	54.0	7	13	37.0	6	6	6	7.5	48.6	135	147	159	8	7	60.0	5	12	6	8	0
46 FT	27	32	16	9	7	6.5	6	6.5	55.0	51.0	51.0	51.0	7	13	53.5	7	13	37.5	6	6	6	7.5	48.9	136	148	160	8	7	60.0	5	12	6	8	0
48 FT	28	32	16	9	7	6.5	6	6	54.9	52.0	52.0	52.0	7	13	53.0	7	13	37.0	7	8	6	7.5	49.0	136	148	160	8	7	60.0	5	12	6	8	0
50 FT	29	33	17	9	7	6.5	6	6.5	55.6	53.0	53.0	53.0	7	13	52.5	7	13	37.0	7	7.5	6	7	49.5	137	149	161	8	7	60.0	5	12	6	7.5	0



IF DESIGN FILL IS BETWEEN TABULATED DESIGN FILLS. USE THE NEXT GREATER TABULATED DESIGN FILL, EXCEPT FOR DESIGN FILLS BETWEEN 2 FEET AND 4 FEET. FOR DESIGN FILLS BETWEEN 2 FEET AND 4 FEET SET THE GREATER MEMBER THICKNESS. AREA OF REINFORCEMENT AND BAR DIMENSIONS FROM THE 2 FEET AND 4 FEET TABULATED DESIGN FILLS. AREA OF REINFORCEMENT EDUALS BAR AREA PER FOOT SPACING.

SPECIAL DESIGNS ARE REQUIRED WHEN THE DESIGN FILL IS LESS THAN 1 FOOT OR GREATER THAN 50 FEET.

DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.

DESIGN FILLS ARE MEASURED FROM THE TOP OF TOP SLAB TO THE TOP OF EARTH FILL OR ROADWAY.

CULVERTS MEET STRENGTH AND SERVICEABILITY REQUIREMENTS FOR THE DESIGN VEHICULAR LIVE LOAD HL-93 MINUS THE LANE LOAD.



MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)



CONCRETE DOUBLE BOX CULVERT

MEMBER THICKNESS BAR SIZE, SPACING & DIMENSIONS

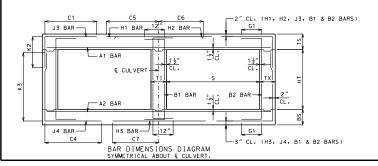
SPAN (S): 11 FEET HEIGHT (HT): 6 THRU 11 FEET

DATE EFFECTIVE: DATE PREPARED: 9/8/2011

703.47

SHEET NO. 16 OF 27

										SPA						HE I	GHT	(HT)	= '	12 F1	OR	13	FT OF											
ll	١.	MEM	BER	_							TOP SL.	AB BARS												TOM SLA	B BAR	S						L BA		
DESIGN		THICK	ME 5	>	A1	BARS			J3	BARS				H1 BA	RS		H2 BA	RS	A2	BARS			J4	BARS				нз ва	RS	B1	BARS	B2	2 BARS	
FILL	TS	BS	ТX	ΤI	SIZE	SPA.	SIZE	SPA.	C1	HT=12	K2 HT=13	HT=14'	SIZE	SPA.	C5	SIZE	SPA.	C6	SIZE	SPA.	SIZE	SPA.	C4	HT=12'	K3 HT=13'	HT=14	SIZE	SPA.	C7	SIZE	SPA.	SIZE	SPA.	G1
1 FT	14	12	9	11	5	6	5	6	55.6	34.0	34.0	34.0	5	13	110.0	5	13	30.5	5	8	6	6	94.6	152	164	176	5	9	51.5	5	12	5	8.5	12
2 FT	14	12	9	11	5	6	6	7.5	55.6	34.0	34.0	38.0	5	12	110.0	5	12	30.0	5	7.5	6	6	89.4	152	164	176	5	6	51.0	5	12	5		12
4 FT	10	12	10	11	5	7	6	7	58.3	30.0	30.0	34.0	6	16	112.5	6	16	35.5	5	7	6	6.5	83.4	152	164	176	6	7	53.5		11.5	5		12
6 FT	10	12	10	11	5	7.5	6	6.5	78.8	30.0	34.0	34.0	6	15	57.5	6	15	34.0	5	6.5	6	6	77.1	152	164	176	6	6.5	52.5	5	12	5		12
8 FT	10	13	10	11	5	7.5	6	6	70.1	34.0	34.0	34.0	6	14	54.0	6	14	33.5	5	6	6	6	74.1	153	165	177	6	6.5	52.0	5	12	5		0
10 FT	11	13	11	11	5	7.5	6	7	67.0	31.0	31.0	35.0	6	14	52.5	6	14	33.0	5	6	6	6	69.9	153	165	177	6	6	51.5	5	12	5		0
12 FT	12	14	12	11	5	7	6	8	64.6	32.0	32.0	36.0	6	14	51.5	6	14	33.0	6	8	6	7	67.6	154	166	178	6	6	51.5	5	12	5	7	0
14 FT	13	15	12	11	5	6.5	6	7	63.4	33.0	37.0	37.0	6	13	51.0	6	13	33.0	6	7.5	6	6.5	66.4	155	167	179	6	6	51.0	5	12	5		0
16 FT	14	16	13	11	5	6	6	7	62.3	34.0	38.0	38.0	6	13	51.0	6	13	33.0	6	7	6	7	64.8	156	168	180	6	6	51.0	5	12	5	6.5	0
18 FT	15	17	13	11	6	8	6	6.5	67.6	35.0	39.0	39.0	6	12	56.5	6	12	38.5	6	6.5	6	6	63.8	157	169	181	6	6	51.0	5	12	5	6.5	0
20 FT	16	19	14	11	6	8	6	6.5	67.4	36.0	40.0	40.0	6	12	56.0	6	12	38.5	6	7.5	6	6.5	63.8	159	171	183	6	6	51.5	5	12	5	6	0
22 FT	17	20	14	11	6	7.5	6	6	67.3	37.0	41.0	41.0	6	12	55.5	6	12	38.5	6	7	6	6	63.5	160	172	184	6	6	51.0	5	12	5	6	0
24 FT	18	21	15	11	6	7	6	6.5	67.4	42.0	42.0	42.0	6	12	55.0	6	12	38.5	6	7	6	6.5	63.4	161	173	185	7	7.5	54.5	5	12	6		0
26 FT	19	22	15	11	6	6.5	6	6.5	65.3	43.0	43.0	43.0	6	13	54.5	6	13	38.0	6	7	6	7	61.1	162	174	186	7	7.5	54.0	5	12	6	8	0
28 FT	20	23	15	11	6	6.5	6	6	65.3	44.0	44.0	44.0	6	12	54.0	6	12	38.0	6	7	6	6.5	61.3	163	175	187	7	7	54.0	5	12	6	8	0
30 FT	21	24	16	11	6	6.5	6	6	65.8	45.0	45.0	45.0	6	12	53.0	6	12	37.0	6	6.5	6	7	61.4	164	176	188	7	7	54.0	5	12	6		0
32 FT	22	25	16	11	6	6	7	7.5	70.8	46.0	46.0	46.0	7	15	57.5	7	15	41.0	6	6.5	6	6.5	61.6	165	177	189	7	6.5	54.0	5	12	6		0
34 FT	23	26	17	11	6	6	6	6	66.4	47.0	47.0	47.0	7	15	56.5	7	15	40.0	6	6.5	6	7	61.9	166	178	190	7	6.5	54.5	5	12	6		0
36 FT	23	27	17	11	7	7.5	7	7	71.3	47.0	47.0	47.0	7	15	56.5	7	15	41.0	6	6.5	6	6.5	62.0	167	179	191	7	6	54.5	5	12	6		0
38 FT	24	28	18	11	7	7.5	7	7.5	71.8	48.0	48.0	48.0	7	14	55.5	7	14	40.0	6	6	6	6.5	62.4	168	180	192	7	6	54.5	5	12	6	7	0
40 FT	25	29	19	11	7	7.5	7	7.5	72.4	49.0	49.0	49.0	7	14	55.0	7	14	39.0	6	6	6	6.5	62.6	169	181	193	8	7.5	60.5	5	12	6		0
42 FT	26	30	19	11	7	7.5	7	7	72.5	50.0	50.0	50.0	7	13	54.5	7	13	38.0	6	6	6	6.5	62.9	170	182	194	8	7.5	60.5	5	12	6		0
44 FT	27	31	20	11	7	7	7	7.5	73.0	51.0	51.0	51.0	7	14	54.0	7	14	38.0	6	6	6	6	63.3	171	183	195	8	7	60.5	5	12	6		0
46 FT	28	32	20	11	7	7	7	6.5	73.1	52.0	52.0	52.0	7	14	53.5	7	14	38.0	6	6	6	6	63.5	172	184	196	8	7	60.5	5	12	6	6.5	0
48 FT	28	32	21	11	7	6.5	7	6.5	73.6	52.0	52.0	52.0	7	14	53.5	7	14	37.5	7	7	6	6	63.5	172	184	196	8	7	60.5	5	12	6		0
50 FT	28	33	22	11	7	6.5	7	6.5	74.1	52.0	52.0	52.0	7	13	53.5	7	13	37.5	7	7.5	6	6	63.9	173	185	197	8	7	60.5	5	12	6	6	0



SPECIAL DESIGNS ARE REQUIRED WHEN THE DESIGN FILL IS LESS THAN 1 FOOT OR GREATER THAN 50 FEET.

DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.

DESIGN FILLS ARE MEASURED FROM THE TOP OF TOP SLAB TO THE TOP OF EARTH FILL OR ROADWAY.

CULVERTS MEET STRENGTH AND SERVICEABILITY REQUIREMENTS FOR THE DESIGN VEHICULAR LIVE LOAD HL-93 MINUS THE LANE LOAD.



MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)



CONCRETE DOUBLE BOX CULVERT

MEMBER THICKNESS BAR SIZE, SPACING & DIMENSIONS

SPAN (S): 11 FEET HEIGHT (HT): 12 THRU 14 FEET

DATE EFFECTIVE: DATE PREPARED:

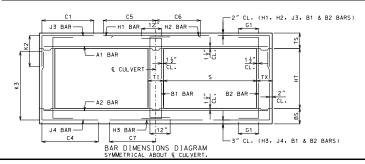
9/8/2011

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SHEET NO. 17 OF 27

										SP	AN (S) = 1	2 F	Т		HE	I GH	Г (НТ) =	6 F1	r or	7 F	T OR	8 FT										
			BER								TOP SL	AB BAR													AB BARS	5						L BAI		
DESIGN		THIC	KNES	S	A1	BARS			J:	BARS				H1 BA	RS		H2 BA	RS	A2	BARS			J4	BARS				нз ва	RS	B1	BARS	B2	2 BARS	3
FILL	TS	BS	тх	ΤI	SIZE	SPA.	SIZE	SPA.	C1	HT=6'	K2 HT=7'	HT=8'	SIZE	SPA.	C5	SIZE	SPA.	C6	SIZE	SPA.	SIZE	SPA.	C4	HT=6'	K3 HT=7'	HT=8'	SIZE	SPA.	C7	SIZE	SPA.	SIZE	SPA.	G1
1 FT	14	10	8	8	5	6	4	6	56.1	30.0	30.0	30.0	5	12	115.0	5	12	31.5	5	7.5	5	6.5	52.4	78	90	102	6	6.5	56.5	5	12	5	12	12
2 FT	15	11	8	8	6	8	4	6.5	59.1	31.0	31.0	31.0	6	16	118.0	6	16	39.0	5	7.5	5	7.5	47.9	79	91	103	6	6.5	56.0	5	12	5		12
4 FT	11	10	8	8	5	6.5	5	7	43.6	31.0	31.0	31.0	6	15	77.5	6	15	36.5	5	6.5	5	6	42.6	78	90	102	7	6.5	58.5	5	12	5	12	12
6 FT	11	11	8	8	5	7	5	6.5	40.9	27.0	31.0	31.0	6	14	63.0	6	14	35.0	5	6.5	5	7	39.3	79	91	103	7	6.5	57.5	5	12	5	12	12
8 FT	11	13	8	8	5	7	5	6	39.1	27.0	27.0	31.0	6	12	58.0	6	12	34.0	5	6	5	8.5	36.3	81	93	105	6	6	54.5	5	12	5	12	0
10 FT	12	14	8	8	5	6.5	5	6.5	37.0	28.0	28.0	32.0	6	12	56.5	6	12	33.5	6	8	5	8.5	34.5	82	94	106	6	6	54.5	5	12	5	12	0
12 FT	14	15	8	8	5	6	5	8	34.6	30.0	34.0	34.0	6	13	55.5	6	13	33.5	6	7.5	5	8.5	33.8	83	95	107	7	7	57.0	5	12	5	12	0
14 FT	15	16	8	8	6	8	5	7.5	38.4	31.0	35.0	35.0	6	12	61.0	6	12	39.5	6	7.5	5	8	32.9	84	96	108	7	7	57.0	5	12	5	12	0
16 FT	16	17	8	8	6	8	5	7	37.5	32.0	36.0	36.0	7	16	65.5	7	16	44.5	6	7	5	7	32.3	85	97	109	7	6.5	57.0	5	12	5	12	0
18 FT	17	19	8	8	6	7.5	5	6.5	37.0	37.0	37.0	37.0	7	15	65.0	7	15	44.0	6	7	5	6.5	31.6	87	99	111	7	7	57.0	5	12	5	10.5	0
20 FT	18	20	8	8	6	7	5	6.5	36.4	38.0	38.0	38.0	7	15	64.5	7	15	44.0	6	6.5	5	6	31.3	88	100	112	7	7	57.0	5	12	5	9.5	0
22 FT	19	21	8	8	6	6	5	6	36.0	39.0	39.0	39.0	7	14	64.0	7	14	44.0	6	6.5	6	7.5	34.1	89	101	113	7	7	57.0	5	12	5	9.5	0
24 FT	21	22	8	8	6	6	6	7	39.6	45.0	45.0	45.0	7	15	63.5	7	15	44.0	6	6.5	6	7	34.4	90	102	114	7	7	56.5	5	12	5	9.5	0
26 FT	21	23	8	8	6	6	6	7	38.3	45.0	45.0	45.0	7	14	63.0	7	14	43.5	6	6.5	6	6.5	32.8	91	103	115	7	7	56.5	5	12	5	9.5	0
28 FT	23	24	8	8	6	6	6	6	38.3	47.0	47.0		7	15	62.0	7	15	43.0	6	6	6	6	33.0	92	104	116	7	7	56.5	5	12	5	9	0
30 FT	23	25	8	8	7	7	6	6	38.3	47.0	47.0	47.0	7	14	62.0	7	14	43.5	6	6	6	6	33.0	93	105	117	7	6.5	56.5	5	12	5	8.5	0
32 FT	25	27	9	8	7	7.5	6	6.5	39.1	49.0	49.0	49.0	7	14	61.0	7	14	41.5	6	6	6	6.5	33.8	95	107	119	7	6	56.5	5	12	5	8.5	0
34 FT	25	28	9	8	7	6.5	6	6.5	39.3	49.0	49.0	49.0	7	13	61.0	7	13	42.5	6	6	6	6	33.8	96	108	120	7	6	56.5	5	12	5	8.5	0
36 FT	26	29	9	8	7	6.5	6	6.5	39.3	50.0	50.0	50.0	7	13	60.0	7	13	41.5	6	6	6	6	33.9	97	109	121	8	7.5	62.5	5	12	5	8	0
38 FT	27	30	10	8	7	6.5	6	7	40.1	51.0	51.0	51.0	7	13	59.0	7	13	41.0	6	6	6	6.5	34.5	98	110	122	8	7.5	62.5	5	12	5	8	0
40 FT	28	31	10	8	7	6.5	6	6.5	40.1	52.0	52.0	52.0	7	12	58.5	7	12	40.0	7	8	6	6	34.6	99	111	123	8	7	62.5	5	12	5	8	0
42 FT	29	32	10	8	7	6.5	6	6.5	40.1	53.0	53.0	53.0	7	12	57.5	7	12	39.0	7	8	6	6	34.9	100	112	124	8	7	62.5	5	12	5	7.5	0
44 FT	30		10	8	7	6.5	6	6	40.3	54.0	54.0		7	12	56.5	7	12	38.5	7	7.5	7	6.5	38.1	101	113	125	8	6.5	62.0	5	12	5	7	0
46 FT	31	34	10	8	7	6	6	6	40.3	55.0	55.0	55.0	8	15	64.0	8	15	45.5	7	7.5	7	6.5	38.3	102	114	126	8	6.5	62.0	5	12	5	6.5	0
48 FT	31	34	11	8	7	6	6	6.5	41.0	55.0	55.0	55.0	8	15	64.0	8	15	46.0	7	6.5	6	6	35.6	102	114	126	8	6.5	62.5	5	12	5	7.5	0
50 FT	32	35	11	8	8	7.5	6	6.5	41.0	56.0	56.0	56.0	8	15	63.5	8	15	45.5	7	7	6	6	35.8	103	115	127	8	6.5	62.0	5	12	5	7	0
																																	==	

										SPA	N (S)	= 12	FΤ			ΗE	GHT	(HT)	= 9	FT.	OR	10 F		11 F										
		MEM	BER								TOP SL	AB BAR	ŝ										BOTT	OM SLA	AB BAR	ŝ					WAL	L BAI	RS	
DESIGN		THICK	NES:	S	A1	BARS			J3	BARS				H1 BA	RS.		H2 BA	RS.	A2	BARS			J4	BARS				нз ва	RS	B1 I	BARS	B2	2 BARS	S
FILL	TS	BS	TX	ΤI	SIZE	SPA.	SIZE	SPA.	C1	HT=9'	K2 HT=10	HT=11'	SIZE	SPA.	C5	SIZE	SPA.	C6	SIZE	SPA.	SIZE	SPA.	C4	HT=9'	K3 HT=10′	HT=11	SIZE	SPA.	C7	SIZE	SPA.	SIZE	SPA.	G1
1 FT	14	11	8	9	5	6	5	8	58.3	34.0	34.0	34.0	5	12	117.5	5	12	32.0	5	7.5	6	6.5	77.5	115	127	139	6	7	57.0	5	12	5	10	12
2 FT	15	12	8	9	6	8	5	8	62.3	35.0	35.0	35.0	6	16	121.5	6	16	39.5	5	7.5	6	7	71.9	116	128	140	6	7	56.5	5	12	5	10	12
4 FT	11	11	9	9	5	6.5	6	7	76.1	31.0	31.0	35.0	6	15	86.0	6	15	37.0	5	6.5	6	7	61.8	115	127	139	6	6	56.0	5	11.5	5	10.5	12
6 FT	11	12	9	9	5	7	6	7	59.0	31.0	31.0	35.0	6	14	63.0	6	14	35.5	5	6	6	7	57.6	116	128	140	6	6	55.0	5	12	5	10	12
8 FT	11	13	9	9	5	7	6	7	54.0	31.0	31.0	35.0	6	13	58.0	6	13	34.5	5	6	6	7	54.5	117	129	141	6	6	55.0	5	12	5	9.5	0
10 FT	12	14	10	9	5	7	5	6	49.0	32.0	32.0	32.0	6	12	56.0	6	12	34.0	6	8	5	6.5	49.3	118	130	142	7	7	57.5	5	12	5	10	0
12 FT	13	15	10	9	5	6.5	6	7.5	50.1	33.0	33.0	33.0	6	12	55.0	6	12	33.5	6	7.5	5	6.5	47.6	119	131	143	7	7	57.5	5	12	5	9	0
14 FT	15	16	10	9	6	8	5	6	50.6	35.0	35.0	35.0	6	12	60.5	6	12	39.5	6	7	5	6	46.4	120	132	144	7	7	57.0	5	12	5	8	0
16 FT	16	17	10	9	6	8	6	7.5	53.8	36.0	36.0	36.0	6	12	60.0	6	12	39.5	6	6.5	5	6	45.4	121	133	145	7	6.5	57.0	5	12	5	8	0
18 FT	17	19	10	9	6	7.5	6	7	53.1	37.0	37.0	41.0	7	16	64.5	7	16	44.5	6	7	6	7.5	47.8	123	135	147	7	7	57.0	5	12	5	8	0
20 FT	18	20	11	9	6	7	6	7.5	53.1	38.0	38.0	38.0	7	15	64.0	7	15	44.0	6	6.5	5	6	44.6	124	136	148	7	7	57.0	5	12	5	7.5	0
22 FT	19	21	12	9	6	6.5	6	7.5	53.5	39.0	39.0	39.0	7	15	63.5	7	15	44.0	6	6.5	5	6.5	44.8	125	137	149	7	7	57.0	5	12	5	7.5	0
24 FT	20	23	12	9	6	6.5	6	7	53.4	40.0	40.0	40.0	7	15	63.0	7	15	44.0	6	6.5	5	6.5	44.6	127	139	151	7	7	57.0	5	12	5	7	0
26 FT	21	23	12	9	6	6	6	7.5	51.4	41.0	41.0	41.0	7	15	62.0	7	15	43.5	6	6	5	6.5	42.8	127	139	151	7	7	57.0	5	12	5	7	0
28 FT	22	25	12	9	6	6	6	7	51.4	42.0	42.0	42.0	7	15	61.5	7	15	43.5	6	6.5	5	6.5	42.9	129	141	153	7	6.5	57.0	5	12	5	7	0
30 FT	23	26	12	9	7	7.5	6	6.5	51.3	43.0	43.0	43.0	7	15	61.0	7	15	43.5	6	6	5	6	43.0	130	142	154	7	6.5	57.0	5	12	5	7	0
32 FT	24	27	13	9	7	7.5	6	7	52.0	44.0	44.0	44.0	7	14	60.5	7	14	42.5	6	6	5	6	43.4	131	143	155	7	6	57.0	5	12	5	6.5	0
34 FT	25	28	13	9	7	7	6	7	52.0	45.0	45.0	45.0	7	14	59.5	7	14	41.5	6	6	5	6	43.5	132	144	156	7	6	57.0	5	12	5	6.5	0
36 FT	26	29	13	9	7	7	6	6	51.9	46.0	50.0	50.0	7	13	58.5	7	13	41.0	6	6	6	8.5	46.6	133	145	157	8	7.5	63.0	5	12	5	6.5	0
38 FT	27	30	14	9	7	7	6	6.5	52.6	47.0	51.0	51.0	7	13	57.5	7	13	40.0	7	8	6	8	47.1	134	146	158	8	7.5	63.0	5	12	5	6	0
40 FT	28	31	14	9	7	6.5	6	6.5	52.6	52.0	52.0	52.0	7	12	56.5	7	12	39.0	7	7.5	6	7.5	47.3	135	147	159	8	7	63.0	5	12	5	6	0
42 FT	28	32	15	9	7	6	6	6.5	53.5	52.0	52.0	52.0	7	12	56.5	7	12	39.5	7	7.5	6	7.5	47.5	136	148	160	8	7	63.0	5	12	6	8	0
44 FT	29	33	15		7	6	6	6.5	53.4	53.0	53.0	53.0	7	12	56.0	7	12	38.5	7	7.5	6	7	47.8	137	149	161	8	6.5	63.0	5	12	6	8	0
46 FT	30	34	15	9	7	6	6	6	53.4	54.0	54.0	54.0	7	12	55.5	7	12	38.0	7	7.5	6	7	47.9	138	150	162	8	6.5	63.0	5	12	6	8	0
48 FT		35	16	9	7	6	6	6.5	54.1	55.0	55.0	55.0	7	12	55.0	7	12	37.5	7	7	6	6.5	48.4	139	151	163	8	6.5	63.0	5	12	6	8	0
50 FT	31	36	16	9	8	7.5	6	6	54.3	55.0	55.0	55.0	7	12	55.0	7	12	37.5	7	7	6	6.5	48.4	140	152	164	8	6.5	63.0	5	12	6	8	0



SPECIAL DESIGNS ARE REQUIRED WHEN THE DESIGN FILL IS LESS THAN 1 FOOT OR GREATER THAN 50 FEET.

DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.

DESIGN FILLS ARE MEASURED FROM THE TOP OF TOP SLAB TO THE TOP OF EARTH FILL OR ROADWAY.

CULVERTS MEET STRENGTH AND SERVICEABILITY REQUIREMENTS FOR THE DESIGN VEHICULAR LIVE LOAD HL-93 MINUS THE LANE LOAD.



MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)

CONCRETE



DOUBLE BOX CULVERT

MEMBER THICKNESS BAR SIZE, SPACING & DIMENSIONS

SPAN (S): 12 FEET HEIGHT (HT): 6 THRU 11 FEET

DATE EFFECTIVE: DATE PREPARED:

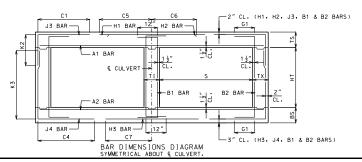
9/8/2011

703.47

SHEET NO. 18 OF 27

										SPAN		= 1:	2 FT			HE	IGHT	(HT:) = 1	12 F											
	١.,	MEM					_				SLAB									_	Е	MOTTO		BARS	_			_		L BA	
DESIGN		HICE	ME 5:	_	A1	BARS	_		J3 BA				H1 BA	RS		H2 BA	RS	A2	BARS		_	J4 BAI	_			H3 BA	RS	B1	BARS	B2	BARS
FILL	TS	BS	ТX	ΤI	SIZE	SPA.	SIZE	SPA.	C1	HT=12'		SIZE	SPA.	C5	SIZE	SPA.	C6	SIZE	SPA.	SIZE	SPA.	C4		3 HT=13′	SIZE	SPA.	C7	SIZE	SPA.	SIZE	SPA. G
1 FT	14	11	9	10	5	6	5	6.5	59.0	34.0	34.0	5	12	118.0	5	12	32.5	5	7	6	6	88.9	151	163	6	6.5	57.5	5	12	5	8.5 1
2 FT	15	12	9	10	6	8	5	7	63.0	35.0	35.0	6	16	122.0	6	16	39.5	5	7	6	6	83.6	152	164	6	7	57.0	5	12	5	8.5 1
4 FT	11	12	9	10	5	6.5	6	7	61.0	35.0	35.0	6	15	120.0	6	15	37.0	5	6.5	6	6	76.5	152	164	6	6.5	56.5	5	12	5	8.5 1
6 FT	11	12	9	10	5	7	6	6.5	73.5	35.0	35.0	6	14	63.5	6	14	35.5	5	6	6	6	70.0	152	164	6	6	55.5	5	12	5	8.5 1
8 FT	11	13	10	10	5	7	6	7	63.9	31.0	35.0	6	13	58.0	6	13	34.5	5	6	6	6.5	65.8	153	165	6	6	55.0	5	12	5	8 (
10 FT	12	14	10	10	5	7	6	7	61.6	36.0	36.0	6	12	56.5	6	12	34.5	6	8	6	6	63.1	154	166	7	7	57.5	5	12	5	8 (
12 FT	13	15	11	10	5	6.5	6	7.5	59.9	33.0	37.0	6	12	55.0	6	12	34.0	6	7.5	6	6.5	61.4	155	167	7	7	57.5	5	12	5	7.5
14 FT	14	16	12	10	5	6	6	7.5	58.8	34.0	38.0	6	12	54.5	6	12	34.0	6	7	6	7.5	60.0	156	168	7	7	57.5	5	12	5	7 (
16 FT	16	18	12	10	6	8	6	7	64.1	36.0	40.0	6	12	60.0	6	12	40.0	6	7	6	7.5	59.5	158	170	6	6	54.0	5	12	5	7 (
18 FT	17	19	12	10	6	7.5	6	6.5	63.1	37.0	41.0	6	12	59.5	6	12	39.5	6	7	6	6.5	58.5	159	171	7	7	57.0	5	12	5	7 (
20 FT	18	20	13	10	6	7	6	6.5	62.6	38.0	42.0	6	12	58.5	6	12	39.5	6	6.5	6	7.5	57.9	160	172	7	7	57.0	5	12	5	6.5
22 FT	19	21	13	10	6	6.5	6	6.5	62.3	39.0	43.0	7	16	63.0	7	16	44.5	6	6	6	6.5	57.5	161	173	7	7	57.0	5	12	5	6.5
24 FT	20	23	14	10	6	6.5	6	6.5	62.5	40.0	44.0	7	16	62.5	7	16	44.0	6	6.5	6	7.5	57.8	163	175	7	7	57.0	5	12	5	6 (
26 FT	21	24	14	10	6	6	6	6	62.3	41.0	45.0	7	15	62.0	7	15	44.0	6	6.5	6	7	57.6	164	176	7	7	57.0	5	12	5	6 (
28 FT	22	25	14	10	6	6	6	6	59.8	42.0	46.0	7	15	61.0	7	15	43.5	6	6.5	6	7.5	55.1	165	177	7	6.5	57.0	5	12	5	6
30 FT	23	26	15	10	7	8	6	6	60.3	47.0	47.0	7	15	60.0	7	15	42.5	6	6	6	7.5	55.4	166	178	7	6.5	57.0	5	12	6	8 (
32 FT	24	27	15	10	- 1	7.5	6	6	60.3	48.0	48.0	7	14	59.5	7	14	42.0	6	6	6	7.5	55.5	167	179	-	6	57.0	5	12	6	8
34 FT	25	28	16	10	7	7.5	6	6	60.9	49.0	49.0	1 4	14	58.5	7	14	41.0	6	6	6	7.5	55.8	168	180	 '	7.5	57.0	5	12	6	8 (
36 FT 38 FT	25 26	30	16	10	7	6.5	 '	7.5	65.8	50.0	49.0	7	13	57.5	7	13	40.5	6	7.5	6	7.5	56.1	170	181	8	7.5	63.0	5	12	6	7.5
38 FT	26	31	17	10	7	6.5	6	7.5	66.5	51.0	51.0	1 7	13	57.0	7	13	40.5	1 7	7.5	6	7	56.3	170	183	8	7.5	63.0	5	12	6	7.5
40 FT	28	32	18	10	7	6.5	1 7	7.5	67.1	52.0	52.0	1 7	12	56.5	7	12	39.0	1 7	7.5	6	6.5	56.6	172	184	8	7	63.0	5	12	6	7 (
42 FT	29	33	18	10	7	6.5	1 7	7	67.1	53.0	53.0	7	12	56.0	7	12	38.0	7	7.5	6	6.5	56.9	173	185	8	6.5	63.0	5	12	6	7 (
46 FT	29	34	19	10	7	6	1 7	7.5	67.9	53.0	53.0	7	12	56.0	7	12	38.5	7	7.5	6	6.5	57.0	174	186	8	6.5	63.0	5	12	6	6.5
48 FT	30	35	19	10	7	6	1 7	6.5	67.9	54.0	54.0	7	12	55.0	7	12	38.0	1 7	7	6	6.5	57.3	175	187	8	6.5	63.0	5	12	6	6.5
50 FT	31	36	20	10	7	6	+ +	7	68.6	55.0	55.0	7	13	54.5	7	13	37.5	1 7	7	6	6.5	57.6	176	188	8	6	63.0	5	12	6	6.5
0 (1)	JI	26	20	- 10					00.0	33.0	1 22.0		1.3	37.3	-	1 13	31.3		- '	_ °	0.5	31.0	1.76	1 100	_ •	1 6	03.0	,	1.2	_ 0	0.5

											(S)		2 FT			HE	IGHT	(HT) = 1	4 F												
í I		MEM									SLAB I										E	BOTTOM	SLAB E	BARS						L BA		
DESIGN	1	HICH	NESS	<u> </u>	A1	BARS			J3 BA				H1 BA	RS		H2 BA	RS	A2	BARS			J4 BA				нз ва	RS	B1	BARS	B	BAR	S
FILL	TS	BS	тх	ΤI	SIZE	SPA.	SIZE	SPA.	C1	K HT=14'	2 HT=15'	SIZE	SPA.	C5	SIZE	SPA.	C6	SIZE	SPA.	SIZE	SPA.	C4	HT=14		SIZE	SPA.	C7	SIZE	SPA.	SIZE	SPA.	G1
1 FT	14	12	10	12	5	6	5	6	60.0	34.0	34.0	5	12	119.0	5	12	32.5	5	7	6	6	98.8	176	188	6	7	58.0	5	12	5	8	12
2 FT	15	12	10	12	6	8	6	8	67.0	35.0	39.0	6	16	126.0	6	16	40.0	5	6.5	6	6	92.5	176	188	6	6.5	57.0	5	12	5	8	12
4 FT	11	13	10	12	5	6.5	6	6.5	62.0	35.0	35.0	6	16	121.0	6	16	37.5	5	6.5	6	6	89.8	177	189	6	7	57.0	5	12	5	7	12
6 FT	11	13	11	12	5	7	6	7	83.8	31.0	35.0	6	15	61.0	6	15	36.0	5	6	6	6.5	81.4	177	189	6	6.5	56.0	5	12	5	7	12
8 FT	11	13	12	12	5	7	6	7.5	73.9	35.0	35.0	6	13	57.5	6	13	35.0	5	6	6	6.5	76.1	177	189	7	7	58.0	5	12	5	7	0
10 FT	12	14	12	12	5	7	6	7	71.4	36.0	36.0	6	13	56.0	6	13	35.0	6	8	6	6.5	74.1	178	190	7	7	58.0	5	12	5	7	0
12 FT	13	15	13	12	5	6.5	6	7.5	68.8	37.0	37.0	6	13	55.0	6	13	34.5	6	7.5	6	6.5	71.6	179	191	7	7	57.5	5	12	5	6.5	0
14 FT	14	16	13	12	5	6	6	6.5	67.3	38.0	38.0	6	12	54.5	6	12	34.5	6	6.5	6	6	70.1	180	192	7	7	57.5	5	12	5	6.5	0
16 FT	15	18	14	12	6	8	6	6.5	72.1	39.0	39.0	6	12	60.0	6	12	40.5	6	7	6	6.5	69.5	182	194	6	6	54.5	5	12	5	6	0
18 FT	17	19	14	12	6	7.5	6	6	72.1	41.0	41.0	6	12	59.5	6	12	40.5	6	6.5	6	6	68.1	183	195	6	6	54.5	5	12	5	6	0
20 FT	18	20	15	12	6	7	6	6	71.5	42.0	42.0	6	12	59.0	6	12	40.0	6	6.5	6	6	67.1	184	196	7	7	57.5	5	12	6	8	0
22 FT	19	22	16	12	6	6.5	6	6	71.4	43.0	43.0	6	12	58.5	6	12	40.0	6	6.5	6	6	67.4	186	198	7	7	57.5	5	12	6	8	0
24 FT	20	23	16	12	6	6.5	6	6	71.3	44.0	44.0	6	12	58.0	6	12	40.0	6	6.5	6	6	67.1	187	199	7	7	57.5	5	12	6	8	0
26 FT	21	24	17	12	6	6	6	6	71.4	45.0	45.0	6	12	57.0	6	12	39.5	6	6	6	6	67.1	188	200	7	7	57.5	5	12	6	7.5	0
28 FT	22	25	17	12	6	6	6	6	69.1	46.0	46.0		15	61.5	-	15	44.0	6	6	6	6.5	64.9	189	201		6.5	57.5	5	12	6	7.5	0
30 FT	23	26	17	12	6	6		7.5	74.1	47.0	47.0		15	61.0	-	15	43.0	6	6	6	6.5	64.9	190	202		6.5	57.5	5	12	6	7.5	0
32 FT 34 FT	23	27	18	12	7	7	1	6.5	74.5	47.0	47.0	-	14	60.0	7	14	44.0	6	6	6	6	65.3	191	203		6	57.5	5	12	6	7.5	0
36 FT	25	28	19	12	7	7	1	7	75.0	49.0	49.0	-	14	59.0	7	14	42.0	7	7.5		6.5	65.5	193	204	8	7.5	63.5			6	6.5	H
38 FT	26	30	20	12	7	7	7	7.5	75.5	50.0	50.0	-	13	58.0	7	13	41.5	7	7.5	6	6	65.9	193	206	8	7.5	63.5	5	12	6	6.5	₩
40 FT	27	31	20	12	7	7	7	6.5	75.6	51.0	51.0	7	13	57.5	7	13	40.5	7	7.5	6	6	66.0	195	207	8	7.3	63.5	5	12	6	6.5	₩
40 FT	28	32	21	12	7	6.5	7	7	76.3	52.0	52.0	7	12	57.0	7	12	39.5	7	7	6	6	66.4	196	208	8	7	63.5	5	12	6	6	6
44 FT	28	33	22	12	7	6.5	1 7	7	76.6	52.0	58.0	7	12	57.0	7	12	40.0	1 7	7	7	7.5	69.6	197	209	8	6.5	63.5	5	12	6	6	1
46 FT	29	34	22	12	7	6.5	7	6	76.8	53.0	59.0	7	12	56.5	7	12	39.0	7	7	7	7.5	69.9	198	210	8	6.5	63.5	5	12	6	6	6
	30		24	12	7	6	7	7	78.0	54.0	60.0	7	12	56.0	7	12	39.0	7	1 7	7	7.5	70.4	199	211	8	6.5	64.0	5	12	6	6	6
	30		24	12	7	6	7	6	78.0	54.0	60.0	7	12	56.0	7	12	39.0	7	1 7	7	7.5	70.5	200	212	8	6	64.0	5	12	7	8	0



SPECIAL DESIGNS ARE REQUIRED WHEN THE DESIGN FILL IS LESS THAN 1 FOOT OR GREATER THAN 50 FEET.

DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.

DESIGN FILLS ARE MEASURED FROM THE TOP OF TOP SLAB TO THE TOP OF EARTH FILL OR ROADWAY.

CULVERTS MEET STRENGTH AND SERVICEABILITY REQUIREMENTS FOR THE DESIGN VEHICULAR LIVE LOAD HL-93 MINUS THE LANE LOAD.



MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)



CONCRETE DOUBLE BOX CULVERT

MEMBER THICKNESS BAR SIZE, SPACING & DIMENSIONS

SPAN (S): 12 FEET HEIGHT (HT): 12 THRU 15 FEET

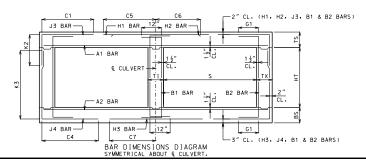
DATE EFFECTIVE: DATE PREPARED: 9/8/2011

703.47

SHEET NO. 19 OF 27

										SP.	AN (S) = 1	3 F	T		HE	IGH	(HT) =	7 F	r or	≀ 8 F		9 FT										
		MEM									TOP SL	AB BARS												OM SLA	B BARS	5						L BAI		
DESIGN		THICK	(NES	5	A1	BARS			J3	BARS				H1 BA	RS		H2 BA	RS	A2	BARS			J4	BARS				нз ва	RS	B1 I	BARS	B2	BARS	
FILL	TS	BS	ТX	ΤI	SIZE	SPA.	SIZE	SPA.	C1	HT=7'	K2 HT=8'	HT=9'	SIZE	SPA.	C5	SIZE	SPA.	C6	SIZE	SPA.	SIZE	SPA.	C4	HT=7'	K3 HT=8'	HT=9'	SIZE	SPA.	C7	SIZE	SPA.	SIZE	SPA. G	31
1 FT	14	10	8	8	5	6	5	8.5	61.8	30.0	34.0	34.0	5	12	125.5	5	12	36.5	5	7	6	7	61.0	90	102	114	6	6	60.0	5	12	5	12 1	12
2 FT	15	12	8	8	6	8	5	8	65.8	31.0	35.0	35.0	6	16	129.5	6	16	43.5	5	7	5	7	53.8	92	104	116	6	6.5	59.5	5	12	5	12 1	12
4 FT	11	11	8	8	6	8	6	7	52.1	31.0	31.0	31.0	6	13	82.0	6	13	38.0	5	6.5	5	6	46.5	91	103	115	7	6.5	62.0	5	11	5	12 1	2
6 FT	12	12	8	8	5	6.5	5	6.5	44.1	32.0	32.0	32.0	6	13	68.0	6	13	36.5	5	6	5	6.5	42.8	92	104	116	7	6.5	61.0	5	12	5	12 1	12
8 FT	12	13	8	8	5	6	5	6	41.5	32.0	32.0	32.0	7	16	65.0	7	16	38.5	5	6	5	6.5	40.0	93	105	117	7	6.5	60.5	5	12	5	12 (ō
10 FT	13	15	8	8	5	6	5	6	39.5	29.0	33.0	33.0	7	15	63.0	7	15	38.0	6	7.5	5	8	38.0	95	107	119	7	7	60.5	5	12	5	12 (ō
12 FT	15	16	8	8	6	8	5	6.5	42.4	35.0	35.0	35.0	7	16	70.0	7	16	46.0	6	7	5	7.5	37.1	96	108	120	7	6.5	60.0	5	12	5	11 (٥
14 FT	16	17	8	8	6	8	5	6	41.1	36.0	36.0	36.0	7	15	69.0	7	15	46.0	6	7	5	7	36.1	97	109	121	7	6.5	60.0	5	12	5	10 0	٥
16 FT	17	18	8	8	6	7.5	5	6	40.1	37.0	37.0	37.0	7	14	68.5	7	14	45.5	6	6	5	6.5	35.4	98	110	122	7	6.5	60.0	5	12	5	9.5	٥
18 FT	18	20	8	8	6	6.5	6	8	43.5	38.0	38.0	38.0	7	14	68.0	7	14	45.5	6	6.5	5	6	34.8	100	112	124	7	6.5	60.0	5	12	5	9.5	٥
20 FT	20	21	8	8	6	6.5	6	7.5	42.6	44.0	44.0	44.0	7	14	67.0	7	14	45.5	6	6	6	7.5	37.5	101	113	125	7	6.5	60.0	5	12	5	9 (٥
22 FT	21	23	8	8	6	6	6	6.5	42.5	45.0	45.0	45.0	7	14	66.5	7	14	45.0	6	6	6	6.5	37.3	103	115	127	7	6.5	60.0	5	12	5	8 0	٥
24 FT	22	24	9	8	6	6	6	7.5	43.1	42.0	42.0	46.0	7	13	66.0	7	13	45.0	6	6	6	7	37.6	104	116	128	7	6.5	60.0	5	12	5	8.5	
26 FT	23	25	9	8	7	7.5	6	6.5		47.0	47.0	47.0	7	13	65.5	7	13	45.0	6	6	6	7	37.6	105	117	129	7	6.5	60.0	5	12	5	8.5	_
28 FT	24	26	9	8	7	7.5	6	7	41.3	48.0	48.0	48.0	7	13	64.5	7	13	44.5	7	8	6	6.5	36.1	106	118	130	7	6.5	59.5	5	12	5	8.5	
30 FT	25	27	9	8	7	7	6	6	41.3	49.0	49.0	49.0	7	13	64.0	7	13	44.5	7	7.5	6	6.5	36.3	107	119	131	7	6	59.5	5	12	5	7.5 0	
32 FT	26	29	10	8	7	7	6	7	42.3	50.0	50.0	50.0	7	13	63.5	7	13	44.0	7	8	6	6.5	36.9	109	121	133	8	7.5	65.5	5	12	5	8 0	
34 FT	27	30	10	8	7	6.5	6	6.5	42.3	51.0	51.0	51.0	7	13	62.5	7	13	43.5	7	7.5	6	6.5	37.0	110	122	134	8	7.5	65.5	5	12	5	7.5 0	
36 FT	28	31	11	8	7	6.5	6	7.5	43.1	52.0	52.0	52.0	7	12	62.0	7	12	42.5	7	7.5	6	7	37.5	111	123	135	8	7	65.5	5	12	5	7.5	
38 FT	29	32	11	8	7	6	6	7	43.1	53.0	53.0	53.0	7	12	61.0	7	12	41.5	7	7.5	6	6.5	37.6	112	124	136	8	7	65.5	5	12	5	7.5	
40 FT	30	33	11	8	7	6	6	7	43.1	54.0	54.0	54.0	7	12	60.0	7	12	41.0	7	7	6	6.5	37.9	113	125	137	8	6.5	65.5	5	12	5	7 (_
42 FT	31	34	12	8	7	6	6	7.5	44.0	55.0	55.0	55.0	8	15	67.0	8	15	48.0	7	7	6	7	38.4	114	126	138	8	6.5	65.5	5	12	5	7 (_
44 FT	32	35	12	8	8	7.5	6	7	44.0	56.0	56.0	56.0	8	14	66.5	8	14	47.0	7	7	6	6.5	38.5	115	127	139	8	6.5	65.5	5	12	5	7 (
46 FT	33	36	12	8	8	17	6	7	44.0	57.0	57.0	57.0	8	14	66.0	8	14	46.0	1	7	6	6.5	38.8	116	128	140	8	6	65.5	5	12	5		0
48 FT	33	37	12	8	8	6.5	6	7	44.0	57.0	57.0	57.0	8	13	66.0	8	13	46.5	<u> </u>	6.5	6	6.5	38.8	117	129	141	8	6	65.5	5	12	5	6.5	
50 FT	34	38	12	8	8	7	6	6	44.0	58.0	58.0	58.0	8	14	65.0	8	14	46.0	7	6.5	6	6	39.0	118	130	142	8	6	65.5	5	12	5	6 0	0
										60.1	1 (C)						CLLT	(IIIT)					F.T. OF	10 0										_

										SPA	N (S)	= 13	FT			ΗE	GHT	(HT)	= '	10 F1	OR	11	FT OF	12 F	F T									
		MEM	BER								TOP SL	AB BAR	S										BOTT	OM SLA	AB BAR	ŝ					WAL	L BAI	RS	
DESIGN		THICH	NES	S	A1	BARS			J3	BARS				H1 BA	RS.		H2 B4	\RS	A2	BARS			J4	BARS				нз ва	RS	B1 I	BARS	B2	2 BARS	S
FILL	TS	BS	TX	ΤI	SIZE	SPA.	SIZE	SPA.	C1	HT=10	K2 'HT=11'	HT=12	SIZE	SPA.	C5	SIZE	SPA.	C6	SIZE	SPA.	SIZE	SPA.	C4	HT=10'	K3 HT=11'	HT=12'	SIZE	SPA.	C7	SIZE	SPA.	SIZE	SPA.	G1
1 FT	14	11	9	10	5	6	5	7.5	62.6	34.0	34.0	34.0	5	12	126.5	5	12	36.5	5	6.5	6	6.5	81.1	127	139	151	6	6.5	60.5	5	11.5	5	9.5	12
2 FT	15	12	9	10	6	8	5	7.5	66.6	35.0	35.0	35.0	6	16	130.5	6	16	43.5	5	6.5	6	6.5	75.6	128	140	152	6	6.5	60.0	5	12	5	9	12
4 FT	11	11	9	10	6	8	6	7	78.5	35.0	35.0	35.0	6	13	84.0	6	13	38.0	5	6.5	6	6	66.3	127	139	151	7	6.5	62.0	5	9	5	8.5	12
6 FT	12	12	9	10	5	6.5	6	6.5	63.6	32.0	36.0	36.0	6	13	67.0	6	13	37.0	5	6	6	6	61.5	128	140	152	7	6.5	61.5	5	12	5	8.5	12
8 FT	12	14	9	10	5	6	6	6.5	58.3	32.0	32.0	36.0	6	12	61.5	6	12	36.0	6	8	6	6.5	59.1	130	142	154	7	7	61.0	5	12	5	8.5	0
10 FT	13	15	9	10	5	6	6	6	55.4	33.0	33.0	37.0	7	15	63.0	7	15	38.5	6	7.5	6	6.5	56.6	131	143	155	7	7	61.0	5	12	5	8.5	0
12 FT	14	16	10	10	5	6	6	6.5	53.6	34.0	34.0	38.0	7	15	61.5	7	15	38.5	6	7	6	7	54.6	132	144	156	7	6.5	60.5	5	12	5	8	0
14 FT	16	17	10	10	6	8	6	7	58.0	36.0	36.0	40.0	7	15	69.0	7	15	46.5	6	7	6	6.5	53.3	133	145	157	7	6.5	60.5	5	12	5	8	0
16 FT	17	19	11	10	6	7.5	6	7	57.5	37.0	37.0	41.0	7	15	68.5	7	15	46.0	6	6.5	6	8	52.4	135	147	159	7	7	60.5	5	12	5	7.5	0
18 FT	18	20	12	10	6	7	6	7.5	57.4	38.0	38.0	38.0	7	14	68.0	7	14	46.0	6	6.5	5	6	48.8	136	148	160	7	6.5	60.5	5	12	5	7	0
20 FT	19	21	12	10	6	6.5	6	7	56.6	39.0	39.0	43.0	7	14	67.5	7	14	46.0	6	6	6	8	51.1	137	149	161	7	6.5	60.5	5	12	5	7	0
22 FT	21	23	12	10	6	6	6	6.5	56.1	41.0	41.0	45.0	7	14	66.5	7	14	45.5	6	6	6	7.5	51.0	139	151	163	7	6.5	60.5	5	12	5	7	0
24 FT	22	24	13		6	6	6	7	56.5	42.0	42.0	46.0	7	14	66.0	7	14	45.5	6	6	6	8	51.1	140	152	164	7	6.5	60.5	5	12	5	6.5	0
26 FT	23	25	13	10	7	7.5	6	6.5	56.3	43.0	43.0	47.0	7	14	65.5	7	14	45.5	7	7.5	6	7.5	51.0	141	153	165	7	6.5	60.5	5	12	5	6.5	0
28 FT	24	26	13	10	7	7.5	6	6.5	54.4	44.0	44.0	48.0	7	14	64.5	7	14	45.0	7	7.5	6	8	49.1	142	154	166	7	6.5	60.0	5	12	5	6.5	0
30 FT	25	28	13	10	7	7	6	6	54.4	45.0	45.0	49.0	7	14	64.0	7	14	45.0	7	8	6	8	49.3	144	156	168	7	6	60.0	5	12	5	6.5	0
32 FT	26	29	14	10	7	7	6	6.5	55.1	46.0	50.0	50.0	7	13	63.5	7	13	44.0	7	7.5	6	8.5	49.8	145	157	169	8	7.5	66.0	5	12	5	6	0
34 FT	27	30	14	10	7	6.5	6	6	55.0	47.0	51.0	51.0	7	13	62.5	7	13	43.0	7	7.5	6	8	49.8	146	158	170	8	7.5	66.0	5	12	5	6	0
36 FT	28	31	15	10	7	6.5	6	6.5	55.8	52.0	52.0	52.0	7	12	61.5	7	12	42.5	7	7	6	7.5	50.3	147	159	171	8	7	66.0	5	12	6	8	0
38 FT	29	32	15	10	7	6	6	6	55.6	53.0	53.0	53.0	7	12	60.5	7	12	41.5	7	7	6	7.5	50.4	148	160	172	8	7	66.0	5	12	6	8	0
	30	33	16	10	7	6	6	6	56.4	54.0	54.0	54.0	7	12	59.5	7	12	41.0	7	6.5	6	7	50.8	149	161	173		6.5	66.0	5	12	6	8	0
	31	35	16	10	7	6	6	6	56.5	55.0	55.0	55.0	8	15	67.0	8	15	48.0	7	7	6	6.5	51.0	151	163	175	8	6.5	66.0	5	12	6	8	0
44 FT		35	16		8	7	7	7.5	61.4	55.0	55.0	55.0	8	14	67.0	8	14	48.5	7	6	6	6.5	50.9	151	163	175	8	6.5	66.0	5	12	6	8	0
46 FT	32	36	17	10	8	7.5	6	6	57.1	56.0	56.0	56.0	8	14	66.5	8	14	47.5	7	6	6	6.5	51.4	152	164	176	8	6	66.0	5	12	6	7.5	0
48 FT		37	17	10	8	7	7	7.5	62.1	57.0	57.0	57.0	8	14	66.0	8	14	47.0	7	6	6	6.5	51.5	153	165	177	8	6	66.0	5	12	6	7.5	10
50 FT	34	38	17	10	8	7	7	7	62.1	58.0	58.0	58.0	8	14	65.5	8	14	46.5	7	6	6	6	51.8	154	166	178	8	6	66.0	5	12	6	7.5	0



SPECIAL DESIGNS ARE REQUIRED WHEN THE DESIGN FILL IS LESS THAN 1 FOOT OR GREATER THAN 50 FEET.

DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.

DESIGN FILLS ARE MEASURED FROM THE TOP OF TOP SLAB TO THE TOP OF EARTH FILL OR ROADWAY.

CULVERTS MEET STRENGTH AND SERVICEABILITY REQUIREMENTS FOR THE DESIGN VEHICULAR LIVE LOAD HL-93 MINUS THE LANE LOAD.



105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)



CONCRETE DOUBLE BOX CULVERT

MEMBER THICKNESS BAR SIZE, SPACING & DIMENSIONS

SPAN (S): 13 FEET HEIGHT (HT): 7 THRU 12 FEET

DATE EFFECTIVE: DATE PREPARED:

9/8/2011

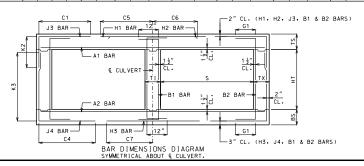
703.47

SHEET NO. 20 OF 27

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

										SPAN	(S)	= 1	3 FT			HE	IGHT	(HT:) = 1	13 F	T OR	14 F	T									
		MEM								TOP	SLAB E	BARS									Е	MOTTO	SLAB E	BARS					WAL	L BA	RS	
DESIGN	Т	HICK	NESS	5	A1	BARS			J3 BA	RS			H1 B4	RS		H2 BA	RS	A2	BARS			J4 BA	RS			нз ва	RS	B1	BARS	B2	2 BARS	5
FILL	TS	BS	ТX	ΤI	SIZE	SPA.	SIZE	SPA.	C1	K HT=13'		SIZE	SPA.	C5	SIZE	SPA.	C6	SIZE	SPA.	SIZE	SPA.	C4	K HT=13'		SIZE	SPA.	C7	SIZE	SPA.	SIZE	SPA.	G 1
1 FT	14	11	11	11	5	6	5	7	64.1	34.0	34.0	5	12	127.5	5	12	36.5	5	6.5	5	6	85.3	163	175	6	6	60.5	5	12	5	8	12
2 FT	15	12	11	11	6	8	5	7	68.1	35.0	35.0	6	16	131.5	6	16	43.5	5	6.5	5	6	80.9	164	176	6	6.5	60.0	5	12	5	7.5	12
4 FT	11	12	11	11	5	6	5	6	92.9	31.0	31.0	6	13	82.5	6	13	38.0	5	6	5	6	75.5	164	176	7	7	62.5	5	11.5	5	7.5	12
6 FT	11	12	11	11	5	6	6	7.5	74.6	31.0	35.0	6	12	64.5	6	12	37.0	5	6	6	6.5	72.1	164	176	7	6.5	61.5	5	12	5		12
8 FT	12	14	11	11	5	6.5	6	7.5	68.5	32.0	36.0	6	12	61.5	G	12	36.5	6	8	6	7	70.1	166	178	7	7	61.5	5	12	5	7.5	0
10 FT	13	15	11	11	5	6.5	6	7	65.9	37.0	37.0	6	12	59.5	6	12	36.0	6	7.5	6	6.5	67.4	167	179	7	6.5	61.0	5	12	5	7.5	0
12 FT	14	16	12	11	5	6	6	7	64.0	38.0	38.0	7	15	61.5	7	15	38.5	6	7	6	7	65.5	168	180	7	6.5	60.5	5	12	5	7	0
14 FT	15	17	12	11	6	7.5	6	6.5	68.5	39.0	39.0	7	15	69.0	7	15	46.5	6	6.5	6	6	64.1	169	181	7	6.5	60.5	5	12	5	7	0
16 FT	17	19	13	11	6	7.5	6	6.5	68.0	41.0	41.0	7	15	68.0	7	15	46.5	6	6.5	6	7	63.4	171	183	7	6.5	60.5	5	12	5	6.5	0
18 FT	18	20	13	11	6	7	6	6	66.9	42.0	42.0	7	15	67.5	7	15	46.5	6	6	6	6	62.4	172	184	7	6.5	60.5	5	12	5	6.5	0
20 FT	19	22	14	11	6	6.5	6	6	66.5	43.0	43.0	7	14	67.0	7	14	46.0	6	6	6	7	62.0	174	186	7	7	60.5	5	12	5	6	0
22 FT	20	23	14	11	6	6	7	8	70.6	44.0	44.0	7	14	66.5	7	14	46.0	6	6	6	6	61.3	175	187	7	6.5	60.5	5	12	5	6	0
24 FT	22	25	15	11	6	6	6	6	66.1	46.0	46.0	7	15	65.5	7	15	45.5	6	6	6	7	61.5	177	189	7	6.5	60.5	5	12	6	8	0
26 FT	23	25	15	11	7	7.5	7	7.5	70.6	47.0	47.0	7	14	65.0	7	14	45.5	7	7	6	6	60.9	177	189	7	6.5	60.5	5	12	6	8	0
28 FT	24	27	16	11	7	7.5	7	8	71.0	48.0	48.0	7	14	64.5	7	14	45.0	7	8	6	7	61.3	179	191	7	6	60.5	5	12	6	8	0
30 FT	25	28	16	11	7	7	7	8	68.5	49.0	49.0	7	14	63.5	7	14	44.0	7	7.5	6	7	58.9	180	192	7	6	60.5	5	12	6	8	0
32 FT	26	29	16	11	7	7	7	7.5	68.4	50.0	50.0	7	13	62.5	7	13	43.5	7	7.5	6	6.5	58.9	181	193	8	7.5	66.5	5	12	6	8	0
34 FT	27	30	17	11		6.5		7.5	69.0	51.0	51.0		13	61.5		13	42.5		7.5	6		59.1	182	194	8	7.5	66.5	5	12	6	7.5	0
36 FT	27	31	17	11		6		6.5	68.9	51.0	51.0		12	61.5	-	12	43.5			6		59.1	183	195	8	_′_	66.5	5	12	6	7.5	0
38 FT	28	33	18	11		6			69.8	52.0	52.0	<u> </u>	12	60.0	-	12	42.5			6	6.5	59.6	185	197	8	6.5	66.5	5	12	6	L-'-	0
40 FT	29	34	19	11	7	6	1	0.5	70.4	53.0	53.0	4	12	59.5	7	12	41.5	1	1 /	6	6.5	60.0	186	198	8	6.5	66.5	5	12	6	6.5	0
42 FT	30	35	19	11	7	6	1	6.5	70.4	54.0	54.0	<u> </u>	12	59.0	1	12	40.5	7	1 /	6	6.5	60.1	187	199	8	6.5	66.5	5	12	6	6.5	0
44 FT	31	36 37	20	11		6	7	1 7	71.0	55.0	55.0	8	15	66.5	8	15	47.5	1	100	6	6	60.5	188	200	8	6	66.5	5	12	6	6.5	0
46 FT 48 FT	32	38	21	11	8	7.5	1 /	6	71.8	56.0	56.0	8	15	66.0	8	15	47.0	1	6.5	6	6	60.8	189	201	8	6	66.5	5	12	6	6	0
50 FT	33	39	22	11	8	7	7	6.5	72.5	57.0	57.0	8	15	65.5	8	15	47.0	7	6.5	6	6	61.3	191	202	8	6	66.5	5	12	6	6	0
[30 FT]	22	29	44	- 1 1	1 8	'		10.5	12.5	31.0	51.0	_ •	1 12	60.5		15	41.0		10.5	L 0	1 0	01.3	191	203	0		00.5	5	12	6	_ 0	
										CD 111	, C \		7 - 7				CLLT				T 00	4.0										

										SPAN	(S)	= 1	3 FT			HE	IGHT	(HT) = 1	5 F	T OR	16 F	T									
		MEM									SLAB										Е	BOTTOM		BARS						L BAI		
DESIGN		THICH	NESS	5	A1	BARS			J3 BA	RS			H1 BA	RS		H2 BA	.RS	A2	BARS			J4 BA	RS			нз ва	RS	B1 f	BARS	B2	2 BARS	ŝ
FILL	TS	BS	тх	ΤI	SIZE	SPA.	SIZE	SPA.	C1	HT=15'	2 HT=16	SIZE	SPA.	C5	SIZE	SPA.	C6	SIZE	SPA.	SIZE	SPA.	C4	K HT=15		SIZE	SPA.	C7	SIZE	SPA.	SIZE	SPA.	G1
1 FT	14	12	12	13	5	6	5	6	65.0	34.0	34.0	5	12	128.5	5	12	36.0	5	6.5	6	7	99.8	188	200	6	6.5	61.0	5	12	5	7	12
2 FT	15	13	12	13	6	8	6	8.5	72.0	35.0	39.0	6	16	135.5	6	16	43.5	5	6.5	6	7	96.4	189	201	6	6.5	60.5	5	12	5	7	12
4 FT	11	13	12	13	5	6	6	7	115.0	35.0	35.0	6	14	81.0	6	14	38.5	5	6	6	6.5	91.6	189	201	6	6	60.5	5	12	5	7	12
6 FT	11	13	12	13	5	6.5	6	6.5	84.8	35.0	35.0	6	13	63.5	6	13	37.5	5	6	6	6	84.8	189	201	7	7	62.0	5	12	5	6.5	12
8 FT	12	14	13	13	5	6.5	6	7	78.8	36.0	36.0	6	13	61.0	6	13	37.0	6	8	6	6.5	80.6	190	202	7	7	61.5	5	12	5	6.5	0
10 FT	13	15	13	13	5	6.5	6	7	75.9	37.0	37.0	6	12	59.5	6	12	36.5	6	7.5	6	6.5	78.4	191	203	7	6.5	61.0	5	12	5	6.5	0
12 FT	14	16	14	13	5	6	6	7	72.9	38.0	38.0	6	12	58.5	6	12	36.5	6	6.5	6	6.5	75.6	192	204	7	6.5	61.0	5	12	5	6	0
14 FT	15	18	14	13	6	8	6	6	77.1	39.0	39.0	7	16	69.0	7	16	47.0	6	6.5	6	6	75.3	194	206	7	7	61.0	5	12	5	6	0
16 FT	16	19	15	13	6	7.5	6	6	76.0	40.0	40.0	7	15	68.0	7	15	47.0	6	6.5	6	6	73.3	195	207	7	6.5	61.0	5	12	6	8	0
18 FT	18	20	16	13	6	7	6	6	76.0	42.0	42.0	7	15	67.5	7	15	47.0	6	6	6	6	71.6	196	208	7	6.5	61.0	5	12	6	8	0
20 FT	19	22	16	13	6	6.5	7	8	80.4	43.0	49.0	7	15	67.5	7	15	47.0	6	6	7	7.5	74.5	198	210	7	7	61.0	5	12	6	8	0
22 FT	20	23	17	13	6	6.5	7	8	79.9	44.0	50.0	7	14	67.0	7	14	46.5	6	6	7	7.5	73.9	199	211	7	6.5	61.0	5	12	6	7.5	0
24 FT	21	24	17	13	6	6	7	7.5	79.6	45.0	51.0	7	14	66.5	7	14	46.5	7	7	7	7	73.6	200	212	7	6.5	61.0	5	12	6	7.5	0
26 FT	23	26	18	13	7	7.5	7	7.5	80.1	47.0	53.0	7	15	65.5	7	15	46.0	7	8	7	8	73.9	202	214	7	6.5	61.0	5	12	6	7	0
28 FT	23	27	19	13	7	7.5	7	7.5	80.0	47.0	47.0	7	14	65.0	7	14	46.0	7	7.5	6	6	70.9	203	215	7	6	61.0	5	12	6	6.5	0
30 FT	24	28	19	13	7	7.5	7	7.5	77.8	48.0	48.0	7	14	64.5	7	14	46.0	7	7.5	6	6	68.5	204	216	7	6	61.0	5	12	6	6.5	0
32 FT	25	29	19	13	7	7	7	7	77.8	49.0	49.0	7	14	63.5	7	14	45.5	7	7.5	6	6	68.6	205	217	8	7.5	67.0	5	12	6	6.5	0
34 FT	26	30	20	13	7	7	7	7	78.3	50.0	50.0	7	13	63.0	7	13	44.5	7	6.5	6	6	68.9	206	218	8	7.5	67.0	5	12	6	6.5	0
36 FT	27	32	21	13	7	6.5	7	7	78.9	51.0	51.0	7	13	62.0	7	13	43.5	7	7	6	6	69.4	208	220	8	7	67.0	5	12	6	6	0
38 FT	28	33	22	13	7	6.5	7	7	79.4	52.0	58.0	7	12	61.0	7	12	43.0	7	7	7	7.5	72.6	209	221	8	6.5	67.0	5	12	6	6	0
40 FT		34	22	13	7	6.5	7	6.5	79.5	59.0	59.0	7	12	60.0	7	12	42.0	7	7	7	7.5	72.9	210	222	8	6.5	67.0	5	12	6	6	0
42 FT	30	35	23	13	7	6	7	6.5	80.1	60.0	60.0	7	12	60.0	7	12	41.0	7	7	7	7.5	73.1	211	223	8	6.5	67.0	5	12	7	7.5	0
44 FT		36	24	13	7	6	7	6.5	80.8	55.0	61.0	8	15	67.5	8	15	48.5	7	6.5	7	7	73.5	212	224	8	6	67.0	5	12	7	7.5	0
46 FT	32		24	13	7	6	7	6	80.8	56.0	62.0	8	15	67.0	8	15	48.0	7	6.5	7	7	73.6	213	225	8	6	67.0	5	12	7	7.5	0
48 FT	32		26	13	8	7.5	7	6	81.9	56.0	62.0	8	14	67.0	8	14	48.0	7	6.5	7	7.5	74.1	214	226	8	6	67.0	5	12	7	7.5	0
50 FT	33	39	27	13	8	7	7	6	82.6	57.0	63.0	8	15	66.0	8	15	47.5	7	6.5	7	7.5	74.5	215	227	8	6	67.0	5	12	7	8	0



SPECIAL DESIGNS ARE REQUIRED WHEN THE DESIGN FILL IS LESS THAN 1 FOOT OR GREATER THAN 50 FEET.

DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.

DESIGN FILLS ARE MEASURED FROM THE TOP OF TOP SLAB TO THE TOP OF EARTH FILL OR ROADWAY.

CULVERTS MEET STRENGTH AND SERVICEABILITY REQUIREMENTS FOR THE DESIGN VEHICULAR LIVE LOAD HL-93 MINUS THE LANE LOAD.



MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)



CONCRETE DOUBLE BOX CULVERT

MEMBER THICKNESS BAR SIZE, SPACING & DIMENSIONS

SPAN (S): 13 FEET HEIGHT (HT): 13 THRU 16 FEET

DATE EFFECTIVE: DATE PREPARED:

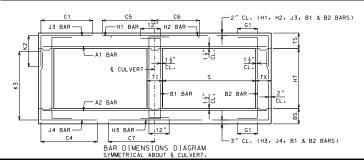
9/8/2011

703.47

SHEET NO. 21 OF 27

											AN (S			T		HE	[GH	(HT) =	7 F1	r of	8 F		9 FT									
			BER	_							TOP SL	AB BARS									_			OM SLA	B BARS	5				_		L BA	
DESIGN		THIC	VIVE 5	•	A1	BARS	-		J 5	BARS				H1 BA	RS		H2 BA	RS	A2	BARS			J4	BARS			_	нз ва	RS	B1	BARS	B2	BARS
FILL	TS	BS	TX	ΤI	SIZE	SPA.	SIZE	SPA.	C1	HT=7'	K2 HT=8'	HT=9'	SIZE	SPA.	C5	SIZE	SPA.	C6	SIZE	SPA.	SIZE	SPA.	C4	HT=7'	K3 HT=8'	HT=9'	SIZE	SPA.	C7	SIZE	SPA.	SIZE	SPA. G
1 FT	15	11	8	8	6	8	5	8	69.3	31.0	35.0	35.0	6	16	137.5	6	16	46.5	5	6.5	5	6	57.8	91	103	115	6	6	63.0	5	12	5	12 1
2 FT	15	12	8	8	6	8	5	8	69.3	35.0	35.0	35.0	6	16	137.5	6	16	48.0	5	6	5	6.5	52.5	92	104	116	6	6	62.5	5	12	5	12 1
4 FT	12	11	8	8	6	7.5	5	6	48.0	32.0	32.0	32.0	6	12	86.0	6	12	39.5	5	6.5	6	7	49.3	91	103	115	7	6	64.5	5	12	5	12 1
6 FT	12	13	8	8	6	8	6	7.5	47.6	32.0	32.0	32.0	7	15	74.0	7	15	41.0	5	6	5	7	41.9	93	105	117	7	6.5	64.5	5	12	5	12 1
8 FT	13	14	8	8	5	6	5	6.5	41.1	33.0	33.0	33.0	7	15	68.5	7	15	40.0	6	8	5	7.5	39.1	94	106	118	7	6.5	64.0	5	12	5	12 (
10 FT	14	15	8	8	6	8	5	6.5	38.6	34.0	34.0	34.0	7	14	66.5	7	14	39.5	6	7.5	5	7.5	37.4	95	107	119	7	6	63.5	5	12	5	12 (
12 FT	16	17	8	8	6	8	5	6.5	41.5	36.0	36.0	36.0	7	14	73.0	7	14	47.5	6	7	5	7	36.1	97	109	121	7	6.5	63.5	5	12	5	11 (
14 FT	17	18	8	8	6	7.5	5	6	40.3	37.0	37.0	37.0	7	14	72.5	7	14	47.0	6	6.5	5	6.5	35.1	98	110	122	7	6.5	63.0	5	12	5	10 (
16 FT	18	20	8	8	6	7	6	8	43.4	38.0	38.0	38.0	7	13	71.5	7	13	47.0	6	6	5	6	34.4	100	112	124	7	6.5	63.0	5	12	5	9.5
18 FT	20	21	8	8	6	6.5	6	7.5	42.4	44.0	44.0	44.0	7	13	71.0	7	13	46.5	6	6	6	7.5	37.0	101	113	125	7	6.5	63.0	5	12	5	9.5
20 FT	21	22	8	8	6	6	6	7	41.8	45.0	45.0	45.0	7	13	70.5	7	13	46.5	7	7.5	6	7	36.5	102	114	126	7	6	63.0	5	12	5	9 (
22 FT	23	24	8	8	7	7.5	6	6	41.3	47.0	47.0	47.0	7	13	69.5	7	13	46.5	7	7.5	6	6	36.4	104	116	128	7	6	63.0	5	12	5	8 (
24 FT	24	26	9	8	7	7.5	6	7	42.1	48.0	48.0	48.0	7	13	69.0	7	13	46.0	7	7.5	6	6.5	36.8	106	118	130	7	6.5	63.0	5	12	5	8.5 (
26 FT	25	27	9	8	7	7	6	6.5	41.9	49.0	49.0	49.0	7	12	68.5	7	12	46.0	7	7.5	6	6.5	36.6	107	119	131	7	6	63.0	5	12	5	8 (
28 FT	26	28	9	8	7	7	6	6	41.8	50.0	50.0	50.0	7	12	68.0	7	12	46.0	7	7.5	6	6	36.6	108	120	132	7	6	63.0	5	12	5	7.5 (
30 FT	27	29	9	8	7	6.5	6	6	41.1	51.0	51.0	51.0	7	12	67.0	7	12	45.5	7	7	6	6	35.4	109	121	133	8	7.5	68.5	5	12	5	7.5 (
32 FT	28	31	10	8	7	6.5	6	6.5	41.8	52.0	52.0	52.0	7	12	66.0	7	12	45.0	7	7	6	6	35.9	111	123	135	8	7	68.5	5	12	5	8 (
34 FT	29	32	10	8	7	6	6	6.5	41.8	53.0	53.0	53.0	7	12	65.5	7	12	44.5	7	7	6	6	36.0	112	124	136	8	7	68.5	5	12	5	7.5 (
36 FT	31	33	10	8	7	6	6	6	41.8	55.0	55.0	55.0	8	15	71.5	8	15	50.5	7	7	7	6.5	39.4	113	125	137	8	6.5	68.5	5	12	5	6.5
38 FT	31	34	11	8	8	7	6	6.5	42.3	55.0	55.0	55.0	8	14	71.5	8	14	51.0	7	6.5	6	6	36.8	114	126	138	8	6.5	68.5	5	12	5	7.5
40 FT	33	35	11	8	8	7.5	6	6	42.3	57.0	57.0	57.0	8	14	69.5	8	14	49.0	7	6	6	6	37.0	115	127	139	8	6.5	68.5	5	12	5	7 (
42 FT	33	37	11	8	8	7	6	6	42.3	57.0	57.0	57.0	8	14	69.5	8	14	49.5	7	6.5	7	6.5	40.1	117	129	141	8	6	68.5	5	12	5	6.5
44 FT	34	38	12	8	8	7	6	6.5	43.3	58.0	58.0	58.0	8	14	69.0	8	14	48.5	7	6.5	6	6	37.6	118	130	142	8	6	68.5	5	12	5	7 (
46 FT	35	39	12	8	8	6.5	6	6.5	43.1	59.0	59.0	59.0	8	13	68.5	8	13	47.5	7	6.5	6	6	37.9	119	131	143	8	6	68.5	5	12	5	6.5 (
48 FT	36	40		8	8	6.5	6	6.5	43.1	60.0	60.0	60.0	8	13	67.5	8	13	46.5	7	6.5	6	6	38.1	120	132	144	9	7	74.5		11.5	5	6 (
50 FT	37	41	12	8	8	6.5	6	6	43.3	61.0	61.0	61.0	8	13	67.0	8	13	46.5	7	6	7	6.5	41.3	121	133	145	9	7	74.5	5	8.5	6	8 (

										SPAI	(S)	= 14	FΤ			ΗE	IGHT	(HT)	= '	10 F1	OR	11	FT OF	12 [T									
		MEM									TOP SL	AB BARS	ŝ										BOTT	OM SLA	B BAR	S					WAL	L BAI	RS	
DESIGN		THICH	NESS	5	Α1	BARS			J3	BARS				H1 BA	\RS		H2 BA	\RS	Α2	BARS			J4	BARS				нз ва	RS	B1 E	3ARS	B2	2 BARS	5
FILL	TS	BS	ТX	ΤI	SIZE	SPA.	SIZE	SPA.	C1	HT=10'	K2 HT=11'	HT=12′	SIZE	SPA.	C5	SIZE	SPA.	C6	SIZE	SPA.	SIZE	SPA.	C4	HT=10	K3 HT=11	HT=12′	SIZE	SPA.	C7	SIZE	SPA.	SIZE	SPA.	G1
1 FT	15	12	8	10	6	8	5	7	69.6	35.0	35.0	35.0	6	16	138.5	6	16	47.0	5	6.5	6	6	83.9	128	140	152	6	6.5	63.5	5	12	5	9.5	12
2 FT	15	13	8	10	6	8	5	6.5	69.6	35.0	35.0	35.0	6	16	138.5	6	16	48.0	5	6	6	6	77.4	129	141	153	6	6.5	63.0	5	12	5	9.5	12
4 FT	12	12	10	10	6	8	5	6	70.1	32.0	32.0	32.0	6	13	85.5	6	13	40.0	5	6	6	7	65.5	128	140	152	7	6.5	65.5	5	10	5	9.5	12
6 FT	12	13	10	10	6	8.5	5	6	58.6	32.0	32.0	32.0	6	12	69.0	6	12	38.0	5	6	6	7	60.8	129	141	153	7	6.5	64.5	5	12	5	9.5	12
8 FT	13	14	10	10	5	6	6	7	57.1	33.0	33.0	37.0	7	15	68.0	7	15	40.5	6	8	6	7	57.4	130	142	154	7	6.5	64.0	5	12	5	9	0
10 FT	14	16	10	10	5	6	6	7	54.4	34.0	34.0	34.0	7	15	66.5	7	15	40.0	6	7	5	6	52.0	132	144	156	7	6.5	64.0	5	12	5	8	0
12 FT	15	17	10	10	6	8	6	7	58.6	35.0	35.0	39.0	7	14	73.0	7	14	48.0	6	7	6	7.5	53.1	133	145	157	7	6.5	63.5	5	12	5	8	0
14 FT	17	18	10	10	6	7.5	6	7	57.1	37.0	37.0	41.0	7	14	72.5	7	14	47.5	6	6.5	6	6.5	52.0	134	146	158	7	6.5	63.5	5	12	5	8	0
16 FT	18	20	11	10	6	7	6	7	57.0	38.0	38.0	42.0	7	14	71.5	7	14	47.5	6	6	6	8	51.5	136	148	160	7	6.5	63.5	5	12	5	7.5	0
18 FT	19	21	12	10	6	6.5	6	7	56.9	39.0	39.0	43.0	7	13	71.0	7	13	47.5	6	6	6	8.5	51.1	137	149	161	7	6.5	63.5	5	12	5	7	0
20 FT	21	23	12	10	6	6	6	7	56.1	41.0	41.0	45.0	7	13	70.5	7	13	47.0	7	8	6	8	50.8	139	151	163	7	6.5	63.5	5	12	5	7	0
22 FT	22	24	12	10	6	6	6	6.5	55.5	42.0	42.0	46.0	7	13	70.0	7	13	47.0	7	7.5	6	7.5	50.1	140	152	164	7	6.5	63.5	5	12	5	7	0
24 FT	23	26	13	10	7	7	6	6.5	55.9	43.0	43.0	47.0	7	12	69.5	7	12	47.0	7	7.5	6	8.5	50.3	142	154	166	7	6.5	63.5	5	12	5	6.5	0
26 FT	25	27	13	10	7	7	6	6.5	55.5	45.0	45.0	49.0	7	13	68.5	7	13	46.5	7	7.5	6	8	50.3	143	155	167	7	6	63.5	5	12	5	6.5	0
28 FT	26	29	14	10	7	7	6	6.5	56.3	46.0	50.0	50.0	7	13	67.5	7	13	46.5	7	7.5	6	8.5	50.5	145	157	169	8	7.5	69.5	5	12	5	6	0
30 FT	27	30	14	10	7	6.5	6	6.5	56.0	47.0	51.0	51.0	7	13	67.0	7	13	46.0	7	7	6	8	50.5	146	158	170	8	7.5	69.5	5	12	5	6	0
32 FT	28	31	14	10	7	6.5	6	6.5	54.3	52.0	52.0	52.0	7	12	66.0	7	12	45.5	7	7	6	7.5	48.9	147	159	171	8	7	69.5	5	12	5	6	0
34 FT	29	32	14	10	7	6	6	6	54.1	53.0	53.0	53.0	7	12	65.0	7	12	44.5	7	7	6	7.5	48.9	148	160	172	8	7	69.0	5	12	5	6	0
36 FT	30	33	15	10	7	6	6	6.5	54.9	54.0	54.0	54.0	7	12	64.0	7	12	44.0	7	6	6	7	49.4	149	161	173	8	6.5	69.5	5	12	6	8	0
38 FT	31	35	15	10	8	7.5	6	6	55.0	55.0	55.0	55.0	8	15	71.0	8	15	51.0	7	6.5	6	6.5	49.6	151	163	175	8	6.5	69.0	5	12	6	8	0
40 FT	32	36	16	10	8	7.5	6	6	55.8	56.0	56.0	56.0	8	14	70.0	8	14	50.0	7	6.5	ø	6.5	50.0	152	164	176	8	6	69.5	5	12	6	8	0
42 FT	33	37	16	10	8	7	6	6	55.8	57.0	57.0	57.0	8	14	69.5	8	14	49.5	7	6.5	ø	6.5	50.1	153	165	177	8	6	69.0	5	12	6	8	0
44 FT	34	38	16	10	8	7	6	6	55.6	58.0	58.0	58.0	8	14	69.0	8	14	48.5	7	6.5	6	6	50.3	154	166	178	8	6	69.0	5	12	6	8	0
46 FT	35	39	17	10	8	7	6	6	56.5	59.0	59.0	59.0	8	13	68.5	8	13	47.5	7	6	6	6	50.8	155	167	179	8	6	69.0	5	12	6	7.5	0
48 FT	35	40	17	10	8	6	7	7.5	61.5	59.0	59.0	59.0	8	12	68.5	8	12	48.0	7	6	6	6	50.8	156	168	180	9	7	75.0	5	12	6	7.5	0
50 FT	36	41	17	10	8	6.5	7	7	61.5	60.0	60.0	66.0	8	13	68.0	8	13	47.5	7	6	7	8	53.9	157	169	181	9	7	75.0	5	12	6	7.5	0



SPECIAL DESIGNS ARE REQUIRED WHEN THE DESIGN FILL IS LESS THAN 1 FOOT OR GREATER THAN 50 FEET.

DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.

DESIGN FILLS ARE MEASURED FROM THE TOP OF TOP SLAB TO THE TOP OF EARTH FILL OR ROADWAY.

CULVERTS MEET STRENGTH AND SERVICEABILITY REQUIREMENTS FOR THE DESIGN VEHICULAR LIVE LOAD HL-93 MINUS THE LANE LOAD.



MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)



CONCRETE DOUBLE BOX CULVERT

MEMBER THICKNESS BAR SIZE, SPACING & DIMENSIONS

SPAN (S): 14 FEET HEIGHT (HT): 7 THRU 12 FEET

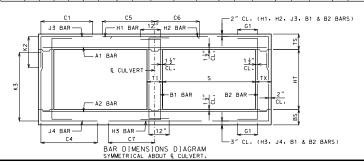
DATE EFFECTIVE: DATE PREPARED: 9/8/2011

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SHEET NO. 22 OF 27

										SPAN	(S)	= 1	4 FT			HE	IGHT	CHT:) = '	13 F	T OF	₹ 14 F	T								
		MEM								TOP	SLAB										E	воттом	SLAB	BARS					WAL	L BA	RS
DESIGN		THICK	NESS	5	A1	BARS			J3 BA	RS			H1 BA	RS		H2 BA	RS	A2	BARS			J4 BA	RS			H3 BA	RS	B1	BARS	B2	2 BARS
FILL	TS	BS	ТX	ΤI	SIZE	SPA.	SIZE	SPA.	C1	HT=13'		SIZE	SPA.	C5	SIZE	SPA.	C6	SIZE	SPA.	SIZE	SPA.	C4		(3 ′HT=14′	SIZE	SPA.	C7	SIZE	SPA.	SIZE	SPA. G
1 FT	15	12	9	11	6	8	5	6	70.4	35.0	35.0	6	16	139.0	6	16	47.0	5	6	6	6	96.1	164	176	6	6	64.0	5	12	5	8.5 1
2 FT	15	13	10	11	6	8	5	6	71.0	35.0	35.0	6	16	139.5	6	16	47.5	5	6	6	6.5	87.6	165	177	6	6.5	63.5	5	12	5	8 1
4 FT	12	12	10	11	6	7.5	6	7.5	100.0	36.0	36.0	6	13	94.5	6	13	40.0	5	6	6	6	77.9	164	176	7	6.5	65.5	5	12	5	8 1
6 FT	12	13	10	11	6	8	6	7	74.8	36.0	36.0	6	12	69.0	6	12	38.5	5	6	6	6	72.4	165	177	7	6.5	65.0	5	12	5	8 1
8 FT	13	14	11	11	5	6	6	7	68.4	37.0	37.0	7	16	68.0	7	16	41.0	6	8	6	7	68.4	166	178	7	6	64.0	5	12	5	7.5 (
10 FT	14	16	11	11	5	6	6	6.5	65.4	38.0	38.0	7	15	66.5	7	15	40.5	6	7	6	6.5	66.8	168	180	7	6.5	64.0	5	12	5	7.5
12 FT	15	17	12	11	6	8	6	6.5	69.4	39.0	39.0	7	14	73.0	7	14	48.0	6	7	6	7	64.6	169	181	7	6.5	64.0	5	12	5	7 (
14 FT	17	18	12	11	6	7.5	6	6.5	67.9	41.0	41.0	7	15	72.0	7	15	48.0	6	6	6	6	63.0	170	182	7	6	63.5	5	12	5	7 (
16 FT	18	20	13	11	6	7	6	6.5	66.9	42.0	42.0	7	14	71.5	7	14	47.5	6	6	6	7	62.1	172	184	7	6.5	63.5	5	12	5	6.5
18 FT	19	21	13	11	6	6.5	6	6	65.6	43.0	43.0	7	13	71.0	7	13	47.5	7	8	6	6	61.0	173	185	7	6.5	63.5	5	12	5	6.5
20 FT	21	23	14	11	6	6	6	6	65.4	45.0	45.0	7	14	70.0	7	14	47.5	7	8	6	7	60.6	175	187	7	6.5	63.5	5	12	5	6 0
22 FT	22	24	14	11	6	6	7	8	69.4	46.0	46.0	7	13	69.5	7	13	47.0	7	7	6	6	59.8	176	188	7	6.5	63.5	5	12	5	6 0
24 FT	23	26	15	11	7	7.5	7	8	69.5	47.0	47.0	7	13	69.0	7	13	47.0	7	7.5	6	7	59.5	178	190	7	6.5	63.5	5	12	6	8 (
26 FT	24	27	15	11	7	7	7	7.5	69.0	48.0	48.0	7	13	68.5	7	13	47.0	7	7	6	6.5	59.3	179	191	7	6	63.5	5	12	6	8 (
28 FT	25	29	16	11	7	6.5	7	7.5	69.5	49.0	49.0	7	13	67.5	7	13	46.5	7	7	6	7	59.5	181	193	8	7.5	69.5	5	12	6	8 (
30 FT	27	30	16	11	7	6.5	7	7	69.3	51.0	51.0	7	13	66.0	7	13	45.5	7	7	6	6.5	59.5	182	194	8	7.5	69.5	5	12	6	8 (
32 FT	28	31	16	11	7	6.5	7	7.5	67.1	52.0	52.0	7	12	65.0	7	12	44.5	7	7	6	7	57.1	183	195	8	7	69.5	5	12	6	8 (
34 FT	29	32	17	11	7	6	7	7.5	67.8	53.0	53.0	7	12	64.0	7	12	44.0	7	6.5	6	7	57.5	184	196	8	7	69.5	5	12	6	7.5
36 FT	30	34	17	11	7	6	7	6.5	67.8	54.0	54.0	7	12	63.0	7	12	43.0	7	7	6	7	57.6	186	198	8	6.5	69.5	5	12	6	7.5
38 FT	31	35	18	11	7	6	7	7	68.5	55.0	55.0	8	15	70.0	8	15	50.5	7	6.5	6	6.5	58.0	187	199	8	6.5	69.5	5	12	6	7 (
40 FT	32	36	18	11	8	7.5	7	6.5	68.4	56.0	56.0	8	14	69.5	8	14	49.5	7	6.5	6	6.5	58.1	188	200	8	6	69.5	5	12	6	7 (
42 FT	33	37	19	11	8	7	7	7	69.1	57.0	57.0	8	14	69.0	8	14	48.5	7	6.5	6	6.5	58.5	189	201	8	6	69.5	5	12	6	6.5
44 FT	33	38	20	11	8	7	7	7	69.9	57.0	57.0	8	14	69.0	8	14	49.0	7	6	6	6	58.9	190	202	8	6	69.5	5	12	6	6.5
46 FT	34	39	20	11	8	7	7	6	69.8	58.0	58.0	8	14	68.5	8	14	48.5	7	6	6	6	59.0	191	203	8	6	69.5	5	12	6	6.5
48 FT	35	41	21	11	8	6.5		6.5	70.6	65.0	65.0	8	13	68.0	8	13	47.5	7	6	7	8	62.5	193	205	9	7	75.5	5	12	6	6 (
50 FT	36	42	22	11	8	6.5	7	6.5	71.4	66.0	66.0	8	14	67.0	8	14	47.5	7	6	7	7.5	63.0	194	206	9	7	75.5	5	12	6	6 0

											(S)		4 FT			HE	IGHT	(HT:) = 1	5 F												
		MEM									SLAB										E	BOTTOM		BARS						L BAI		
DESIGN	1	LH I CH	NESS	3	A1	BARS			J3 BA	RS			H1 BA	RS		н2 ВА	.RS	A2	BARS			J4 BAI	RS			нз ва	RS	B1 f	BARS	B2	2 BARS	S
FILL	TS	BS	тх	ΤI	SIZE	SPA.	SIZE	SPA.	C1	HT=15	2 HT=16	SIZE	SPA.	C5	SIZE	SPA.	C6	SIZE	SPA.	SIZE	SPA.	C4	K HT=15		SIZE	SPA.	C7	SIZE	SPA.	SIZE	SPA.	G1
1 FT	15	13	12	13	6	8	5	6	72.6	35.0	35.0	6	16	141.0	6	16	46.0	5	6.5	6	7.5	102.5	189	201	6	6.5	64.5	5	12	5	7	12
2 FT	15	13	12	13	6	8	6	8	75.6	35.0	39.0	6	16	144.0	6	16	47.5	5	6	6	7	95.8	189	201	6	6	63.5	5	12	5	7	12
4 FT	12	12	12	13	6	8	6	7.5	118.3	36.0	36.0	6	13	86.5	6	13	40.0	5	6	6	6	86.6	188	200	7	6.5	65.5	5	12	5	7	12
6 FT	12	13	12	13	5	6	6	7	86.4	36.0	36.0	6	12	68.0	6	12	39.0	5	6	6	6	83.0	189	201	7	6	65.0	5	12	5	7	12
8 FT	13	15	13	13	5	6	6	7	78.9	37.0	37.0	6	12	64.5	6	12	38.0	6	7.5	6	6.5	80.3	191	203	7	6.5	64.5	5	12	5	6.5	0
10 FT	14	16	13	13	5	6	6	6.5	75.0	38.0	38.0	7	15	66.0	7	15	41.0	6	7	6	6.5	77.3	192	204	7	6.5	64.5	5	12	5	6.5	0
12 FT	15	17	14	13	6	8	6	6.5	78.5	39.0	39.0	7	15	73.0	7	15	48.5	6	6.5	6	6.5	74.1	193	205	7	6.5	64.0	5	12	5	6	0
14 FT	16	19	14	13	6	8	6	6	77.0	40.0	40.0	7	14	72.0	7	14	48.5	6	6	6	6	73.6	195	207	7	6.5	64.0	5	12	5	6	0
16 FT	18	20	15	13	6	7	6	6	76.5	42.0	42.0	7	14	71.5	7	14	48.5	6	6	6	6	72.1	196	208	7	6.5	64.0	5	12	6	8	0
18 FT	19	21	15	13	6	6.5	7	7.5	80.5	43.0	49.0	7	14	71.0	7	14	48.5	7	8	7	7	74.1	197	209	7	6.5	64.0	5	12	6	8	0
20 FT	20	23	16	13	6	6.5	7	7.5	79.9	44.0	50.0	7	13	70.5	7	13	48.0	7	7.5	7	8	73.8	199	211	7	6.5	64.0	5	12	6	8	0
22 FT	22	25	17	13	6	6	7	7.5	79.8	46.0	46.0	7	14	69.5	7	14	48.0	7	7.5	6	6	70.5	201	213	7	6.5	64.0	5	12	6	7.5	0
24 FT	23	26	18	13	7	7.5	7	7.5	79.5	47.0	47.0	7	13	69.0	7	13	47.5	7	7.5	6	6	69.9	202	214	7	6.5	64.0	5	12	6	7	0
26 FT	24	27	18	13	7	7.5	7	7	79.1	48.0	48.0	7	13	68.5	7	13	47.5	7	6.5	6	6	69.6	203	215	7	6	64.0	5	12	6	7	0
28 FT	25	29	19	13	7	7	7	7	79.5	49.0	49.0	7	13	68.0	7	13	47.5	7	7	6	6	70.0	205	217	8	7.5	70.0	5	12	6	6.5	0
30 FT		30	20	13	7	6.5	7	7	79.8	50.0	50.0	7	13	67.0	7	13	47.0	7	6.5	6	6	69.9	206	218	8	7.5	70.0	5	12	6	6.5	0
32 FT	27	31	20	13	7	6.5	7	7	77.4	51.0	51.0	7	13	66.5	7	13	47.0	7	6.5	6	6	67.5	207	219	8	7	70.0	5	12	6	6.5	0
34 FT	28	32	20	13	7	6	7	7	77.4	52.0	52.0	7	12	65.5	7	12	46.0	7	6	6	6	67.6	208	220	8	7	70.0	5	12	6	6.5	0
36 FT	29	34	21	13	7	6	7	7	78.0	53.0	53.0	7	12	64.5	7	12	45.0	7	6.5	6	6	68.1	210	222	8	6.5	70.0	5	12	6	6	0
38 FT	30	35	22	13	7	6	7	6.5	78.6	54.0	60.0	7	12	63.5	7	12	44.5	7	6.5	7	7.5	71.4	211	223	8	6.5	70.0	5	12	6	6	0
40 FT	31	36	22	13	8	7.5	7	6	78.6	61.0	61.0	8	15	71.0	8	15	51.5	7	6.5	7	7.5	71.5	212	224	8	6	70.0	5	12	6	6	0
42 FT	32	37	23	13	8	7.5	7	6.5	79.3	56.0	62.0	8	14	70.0	8	14	51.0	7	6	7	7.5	71.8	213	225	8	6	70.0	5	12	7	7.5	0
44 FT	33		24	13	8	7	7	6.5	80.0	57.0	63.0	8	14	70.0	8	14	50.0	7	6	7	7	72.4	215	227	8	6	70.0	5	12	7	7.5	0
46 FT	34	40	25	13	8	7	7	6.5	80.6	58.0	64.0	8	14	69.5	8	14	49.0	7	6	7	7.5	72.6	216	228	9	7	76.0	5	12	7	7.5	0
48 FT	35	41	26	13	8	7	7	6	81.4	65.0	65.0	8	14	68.5	8	14	48.5	7	6	7	7.5	73.0	217	229	9	7	76.5	5	12	7	8	0
50 FT	35	42	27	13	8	6.5	7	6	82.0	65.0	65.0	8	13	68.5	8	13	48.5	7	6	7	7.5	73.3	218	230	9	7	76.5	5	12	7	8	0



SPECIAL DESIGNS ARE REQUIRED WHEN THE DESIGN FILL IS LESS THAN 1 FOOT OR GREATER THAN 50 FEET.

DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.

DESIGN FILLS ARE MEASURED FROM THE TOP OF TOP SLAB TO THE TOP OF EARTH FILL OR ROADWAY.

CULVERTS MEET STRENGTH AND SERVICEABILITY REQUIREMENTS FOR THE DESIGN VEHICULAR LIVE LOAD HL-93 MINUS THE LANE LOAD.



MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)



CONCRETE DOUBLE BOX CULVERT

MEMBER THICKNESS BAR SIZE, SPACING & DIMENSIONS

SPAN (S): 14 FEET HEIGHT (HT): 13 THRU 16 FEET

DATE EFFECTIVE: DATE PREPARED:

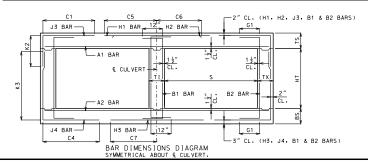
9/8/2011

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SHEET NO. 23 OF 27

										SP) = 1		Т		ΗE	IGH	Г (НТ) =	8 F1	OR	9 F		10 F										
		MEM									TOP SL	AB BARS												roM SLA	AB BAR	S						L BA		
DESIGN		THICK	NESS	5	A1	BARS			J3	BARS				H1 BA	RS		H2 BA	RS	A2	BARS			J4	BARS				H3 BA	RS	B1	BARS	B2	2 BARS	
FILL	TS	BS	ТX	ΤĮ	SIZE	SPA.	SIZE	SPA.	C1	HT=8'	K2 HT=9'	HT=10'	SIZE	SPA.	C5	SIZE	SPA.	C6	SIZE	SPA.	SIZE	SPA.	C4	HT=8'	K3 HT=9'	HT=10	SIZE	SPA.	C7	SIZE	SPA.	SIZE	SPA. G	31
1 FT	15	12	8	8	6	8	5	8	72.9	35.0	35.0	35.0	6	16	146.0	6	16	51.0	5	6	5	6	64.9	104	116	128	6	6	66.5	5	12	5	12 1	12
2 FT	17	13	8	8	6	7.5	5	6.5	72.9	37.0	37.0	37.0	6	14	146.0	6	14	45.5	5	6	5	6	57.8	105	117	129	6	6	65.5	5	12	5	12 1	12
4 FT	13	12	8	8	6	7	5	6	53.1	33.0	33.0	33.0	6	12	92.5	6	12	41.5	5	6	6	6.5	53.3	104	116	128	7	6	68.0	5	12	5	12 1	12
6 FT	13	13	8	8	6	7.5	6	7.5	50.4	33.0	33.0	37.0	7	15	78.5	7	15	42.5	5	6	6	7	48.9	105	117	129	7	6	67.0	5	12	5	12 1	12
8 FT	14	15	8	8	6	8	5	6	44.0	34.0	34.0	34.0	7	14	72.5	7	14	41.5	6	7.5	5	6.5	42.8	107	119	131	7	6	67.0	5	12	5	11 (0
10 FT	15	16	8	8	6	7.5	6	8	50.5	35.0	35.0	35.0	7	13	78.0	7	13	49.0	6	7	5	6.5	40.9	108	120	132	7	6	66.5	5	12	5	10 (0
12 FT	17	18	8	8	6	7.5	6	8	48.4	37.0	37.0	37.0	7	13	76.5	7	13	48.5	6	6.5	5	6	39.6	110	122	134	7	6	66.5	5	12	5	9.5 (0
14 FT	18	19	8	8	6	7	6	7.5	47.0	38.0	38.0	42.0	7	13	75.5	7	13	48.5	6	6	6	8	41.5	111	123	135	7	6	66.5	5	12	5	9.5 (0
16 FT	19	21	8	8	6	6	6	6.5	46.1	39.0	43.0	43.0	7	12	75.0	7	12	48.0	6	6	6	7	40.8	113	125	137	7	6	66.5	5	12	5	9 (0
18 FT	21	22	9	8	6	6	6	7.5	46.0	41.0	41.0	41.0	7	12	74.0	7	12	48.0	7	7.5	5	6	37.8	114	126	138	7	6	66.0	5	12	5	8.5 0	0
20 FT	22	24	9	8	6	6	6	6.5	45.5	42.0	42.0	46.0	7	12	73.5	7	12	47.5	7	7.5	6	7	40.3	116	128	140	7	6	66.0	5	12	5	8.5 0	0
22 FT	24	26	10	8	7	7.5	6	7.5	46.0	44.0	44.0	44.0	7	12	72.5	7	12	47.5	7	7.5	5	6	37.5	118	130	142	7	6	66.0	5	12	5	8 (0
24 FT	25	27	11	8	7	7	6	8	46.5	45.0	45.0	45.0	7	12	71.5	7	12	47.0	7	6.5	5	6	37.5	119	131	143	8	7	72.0	5	12	5		0
26 FT	27	29	11	8	7	6.5	6	8	46.1	47.0	47.0	51.0	7	12	70.5	7	12	47.0	7	7	6	7.5	40.6	121	133	145	8	7	72.0	5	12	5	7.5 (0
28 FT	28	30	11	8	7	6.5	6	7	45.9	52.0	52.0	52.0	7	12	69.5	7	12	46.5	7	6.5	6	7	40.5	122	134	146	8	7	72.0	5	12	5		0
30 FT	29	32	12	8	7	6	6	7.5	46.9	53.0	53.0	53.0	7	12	69.0	7	12	46.5	7	7	6	7.5	41.0	124	136	148	8	7	72.0	5	12	5	7 (0
32 FT	30	33	12	8	7	6	6	7.5	45.4	54.0	54.0	54.0	7	12	67.5	7	12	46.0	7	6.5	6	7	39.5	125	137	149	8	6.5	72.0	5	12	5		0
34 FT	31	34	12	8	8	7.5	6	7.5	45.3	55.0	55.0	55.0	8	15	75.0	8	15	53.0	7	6.5	6	7	39.6	126	138	150	8	6.5	72.0	5	12	5		0
36 FT	32	36	12	8	8	7	6	7	45.4	56.0	56.0	56.0	8	14	73.5	8	14	52.5	7	6.5	6	6.5	39.9	128	140	152	8	6	72.0	5	12	5		0
38 FT	33	37	12	8	8	6.5	6	6.5	45.4	57.0	57.0	57.0	8	13	72.5	8	13	51.5	7	6.5	6	6.5	40.0	129	141	153	8	6	72.0	5	12	5		0
40 FT	35	38	12	8	8	6.5	6	6.5	45.1	59.0	59.0	59.0	8	13	71.0	8	13	49.5	7	6	6	6	40.3	130	142	154	8	6	71.5	5	12	5		0
42 FT	35	39	13	8	8	6	6	6.5	46.1	59.0	59.0	59.0	8	12	71.0	8	12	50.0	7	6	6	6	40.6	131	143	155	8	6	72.0	5	12	5		0
44 FT	36	41	13	8	8	6	6	6.5	46.3	60.0	60.0	60.0	8	12	70.5	8	12	49.0	7	6	7	7	43.9	133	145	157	9	7	77.5	5	9	5		0
46 FT	37	42	13	8	8	6	6	6	46.3	61.0	61.0	61.0	8	12	70.0	8	12	48.0	7	6	7	7	44.1	134	146	158	9	7	77.5	5	6.5	6		0
48 FT	38	43	13	9	8	6	6	6	46.3	62.0	62.0	62.0	8	12	70.5	8	12	48.5	7	6	7	6.5	44.3	135	147	159	9	7	77.5	5	12	6		0
50 FT	39	44	14	9	8	6	6	6	47.1	63.0	63.0	63.0	8	12	70.0	8	12	47.5	8	7.5	7	7	44.8	136	148	160	9	6.5	77.5	5	12	6	8 (0
										CDA	M (C)	4.5	СТ			115	CLIT	/ LLT >	_	4 53	- 00	1.0	CT 05	17 [_

										SPA	N (S)	= 15	FT			HE	IGHT	(HT)	= '	11 FT	r or	12	FT OF		FT									
		MEM	BER								TOP SL	AB BAR											BOTT	OM SLA	AB BAR	ŝ						L BA		
DESIGN		THICH	KNES	S	A1	BARS			J3	BARS				H1 BA	RS.		H2 B4	\RS	A2	BARS			J4	BARS				нз ва	RS	B1 f	BARS	Ba	2 BARS	S
FILL	TS	BS	TX	ΤI	SIZE	SPA.	SIZE	SPA.	C1	HT=11	K2 'HT=12'	HT=13'	SIZE	SPA.	C5	SIZE	SPA.	C6	SIZE	SPA.	SIZE	SPA.	C4	HT=11	K3 HT=12′	HT=13	SIZE	SPA.	C7	SIZE	SPA.	SIZE	SPA.	G1
1 FT	15	12	9	10	6	8	5	6.5	73.9	35.0	35.0	35.0	6	16	147.0	6	16	51.0	5	6	6	6	88.3	140	152	164	6	6	67.0	5	12	5	8.5	12
2 FT	17	13	9	10	6	7.5	5	6.5	73.9	37.0	37.0	37.0	6	14	147.0	6	14	46.0	5	6	6	6	80.4	141	153	165	6	6	66.0	5	12	5	8.5	12
4 FT	13	12	9	10	6	7	6	6	85.5	33.0	37.0	37.0	6	12	96.0	6	12	42.0	5	6	6	6	70.6	140	152	164	7	6	68.5	5	12	5	8.5	12
6 FT	13	14	10	10	6	8	6	7	67.4	33.0	33.0	37.0	7	15	76.5	7	15	43.0	6	8	6	6.5	66.0	142	154	166	7	6.5	68.0	5	12	5	8	12
8 FT	14	15	10	10	6	8	6	6.5	62.0	34.0	34.0	38.0	7	14	72.0	7	14	42.0	6	7.5	6	6.5	62.1	143	155	167	7	6	67.0	5	12	5	8	0
10 FT	15	17	10	10	6	8	6	6.5	64.6	35.0	35.0	39.0	7	14	78.0	7	14	49.5	6	7	6	6.5	59.6	145	157	169	7	6.5	67.0	5	12	5	8	С
12 FT	16	18	11	10	6	7.5	6	6.5	62.6	36.0	36.0	40.0	7	13	76.5	7	13	49.0	6	6.5	6	7.5	57.4	146	158	170	7	6	67.0	5	12	5	7.5	С
14 FT	18	20	12	10	6	7	6	7	62.0	38.0	38.0	42.0	7	13	75.5	7	13	49.0	6	6	6	8	56.4	148	160	172	7	6.5	67.0	5	12	5	7	
16 FT	19	21	12	10	6	6.5	6	6.5	60.9	39.0	39.0	43.0	7	13	74.5	7	13	48.5	7	8	6	7.5	55.4	149	161	173	7	6	66.5	5	12	5	7	Г
18 FT	21	22	12	10	6	6	6	6.5	59.8	41.0	45.0	45.0	7	13	74.0	7	13	48.5	7	7	6	6	54.6	150	162	174	7	6	66.5	5	12	5	7	Г
20 FT	22	24	13	10	6	6	6	6.5	59.9	42.0	42.0	46.0	7	12	73.5	7	12	48.5	7	7	6	7.5	54.4	152	164	176	7	6	66.5	5	12	5	6.5	Г
22 FT	23	26	13	10	7	7	6	6	59.3	43.0	43.0	47.0	7	12	72.5	7	12	48.0	7	7	6	7	53.9	154	166	178	7	6	66.5	5	12	5	6.5	
24 FT	25	28	14	10	7	7	6	6	59.5	45.0	45.0	49.0	7	12	71.5	7	12	48.0	7	7	6	7.5	54.0	156	168	180	7	6	66.5	5	12	5	6	Г
26 FT	26	29	14	10	7	6.5	6	6	59.0	50.0	50.0	50.0	7	12	71.0	7	12	47.5	7	7	6	7.5	53.6	157	169	181	8	7	72.5	5	12	5	6	
28 FT	27	31	15	10	7	6	6	6	59.6	51.0	51.0	51.0	7	12	70.5	7	12	47.5	7	7	6	7.5	53.9	159	171	183	8	7	72.5	5	12	6	8	-
30 FT	29	32	15	10	7	6	7	8	64.3	53.0	53.0	53.0	7	12	69.0	7	12	47.0	7	6.5	6	7.5	54.0	160	172	184	8	7	72.5	5	12	6	8	1
32 FT	30	33	16	10	7	6	6	6	59.9	54.0	54.0	54.0	7	12	68.0	7	12	46.5	7	6	6	7	54.3	161	173	185	8	6.5	72.5	5	12	6	8	1
34 FT	31	35	16	10	8	7.5	6	6	58.3	55.0	55.0	55.0	8	15	75.0	8	15	53.0	7	6.5	6	6.5	52.6	163	175	187	8	6.5	72.5	5	12	6	8	1
36 FT	32	36	16	10	8	7.5	7	7.5	63.1	56.0	56.0	56.0	8	14	74.0	8	14	52.5	7	6.5	6	6.5	52.8	164	176	188	8	6	72.5	5	12	6	8	1
38 FT	33	37	16	10	8	7	7	7	63.1	57.0	57.0	57.0	8	14	72.5	8	14	52.0	7	6	6	6.5	52.9	165	177	189	8	6	72.5	5	12	6	8	
40 FT	34	38	17	10	8	7	7	7.5	63.9	58.0	58.0	58.0	8	14	72.0	8	14	51.0	7	6	6	6	53.3	166	178	190	8	6	72.5	5	12	6	7.5	
42 FT	35	40	18	10	8	6.5	7	7.5	64.8	59.0	59.0	59.0	8	13	71.5	8	13	50.0	7	6	6	6	53.8	168	180	192	9	7	78.5	5	12	6	7	1
44 FT	36	41	18	10	8	6.5	7	7.5	64.6	60.0	60.0	66.0	8	13	71.0	8	13	49.5	7	6	7	8	56.9	169	181	193	9	7	78.5	5	12	6	7	
46 FT	37	42	18	10	8	6.5	7	6.5	64.6	61.0	61.0	67.0	8	12	70.5	8	12	48.5	7	6	7	7.5	57.0	170	182	194	9	7	78.5	5	12	6	7	(
48 FT	38	43	19	10	8	6	7	7	65.4	62.0	62.0	68.0	8	13	69.5	8	13	48.0	8	7.5	7	7.5	57.5	171	183	195	9	7	78.5	5	12	6	6.5	
50 FT	39	44	19	10	8	6	7	6.5	65.3	63.0	63.0	69.0	8	13	69.0	8	13	47.5	8	7.5	7	7	57.6	172	184	196	9	6.5	78.5	5	12	6	6.5	1



SPECIAL DESIGNS ARE REQUIRED WHEN THE DESIGN FILL IS LESS THAN 1 FOOT OR GREATER THAN 50 FEET.

DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.

DESIGN FILLS ARE MEASURED FROM THE TOP OF TOP SLAB TO THE TOP OF EARTH FILL OR ROADWAY.

CULVERTS MEET STRENGTH AND SERVICEABILITY REQUIREMENTS FOR THE DESIGN VEHICULAR LIVE LOAD HL-93 MINUS THE LANE LOAD.



MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)



CONCRETE DOUBLE BOX CULVERT

MEMBER THICKNESS BAR SIZE, SPACING & DIMENSIONS

SPAN (S): 15 FEET HEIGHT (HT): 8 THRU 13 FEET

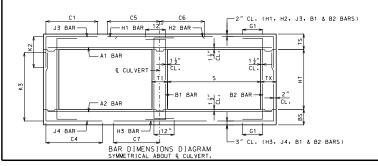
DATE EFFECTIVE: DATE PREPARED:

9/8/2011

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SHEET NO. 24 OF 27

										SPA		= 15				HE I	GHT	(HT)	= 1	14 FT	OR	15											
		MEM		.							TOP SL	AB BARS												OM SLA	B BAR	S					WAL		
DESIGN		THICK	NE 5		A1	BARS			J3	BARS				H1 BA	RS		H2 BA	RS	A2	BARS			J4	BARS				нз ва	RS	B1 I	BARS	Ba	2 BARS
FILL	TS	BS	ТX	ΤI	SIZE	SPA.	SIZE	SPA.	C1	HT=14	K2 HT=15	HT=16'	SIZE	SPA.	C5	SIZE	SPA.	C6	SIZE	SPA.	SIZE	SPA.	C4	HT=14'	K3 HT=15'	HT=16′	SIZE	SPA.	C7	SIZE	SPA.	SIZE	SPA. G1
1 FT	15	13	12	13	6	8	6	8.5	79.3	35.0	35.0	39.0	6	16	152.5	6	16	50.0	5	6	6	7	102.4	177	189	201	6	6	67.5	5	11	5	7 12
2 FT	16	14	12	13	6	7.5	5	6	76.3	36.0	36.0	36.0	6	15	149.5	6	15	48.5	6	8	6	7.5	96.3	178	190	202	6	6	67.0	5	12	5	7 12
4 FT	12	13	12	13	6	7	6	7	101.4	36.0	36.0	36.0	6	12	86.5	6	12	41.5	5	6	6	6.5	88.5	177	189	201	7	6.5	69.0	5	10.5	5	7 12
6 FT	13	14	12	13	6	8	6	6.5	86.3	37.0	37.0	37.0	7	16	74.5	7	16	43.5	6	8	6	6.5	82.9	178	190	202	7	6	68.0	5	12	5	7 12
8 FT	13	15	13	13	6	8	6	6.5	76.4	37.0	37.0	37.0	7	14	70.5	7	14	42.5	6	7.5	6	6.5	77.9	179	191	203	7	6	68.0	5	12	5	6.5 0
10 FT	15	17	13	13	6	8	6	6	80.6	39.0	39.0	39.0	7	14	77.5	7	14	50.5	6	7	6	6.5	76.0	181	193	205	7	6.5	67.5	5	12	5	6.5 0
12 FT	16	18	14	13	6	8	6	6	78.4	40.0	40.0	40.0	7	14	76.5	7	14	50.0	6	6.5	6	6.5	73.8	182	194	206	7	6	67.5	5	12	5	6 0
14 FT	17	20	14	13	6	7.5	7	7.5	81.6	41.0	41.0	41.0	7	13	75.5	7	13	50.0	6	6	6	6	72.9	184	196	208	7	6	67.5	5	12	5	6 0
16 FT	19	21	15	13	6	6.5	7	8	80.9	43.0	43.0	49.0	7	13	75.0	7	13	49.5	7	8	7	8	74.4	185	197	209	7	6	67.0	5	12	6	8 0
18 FT	20	23	16	13	6	6.5	7	8	80.1	44.0	44.0	44.0	7	13	74.0	7	13	49.5	7	7.5	6	6	70.8	187	199	211	7	6	67.0	5	12	6	8 0
20 FT	21	24	17	13	6	6	7	7.5	79.5	45.0	45.0	45.0	7	12	73.5	7	12	49.5	7	7	6	6	69.8	188	200	212	7	6	67.0	5	12	6	7.5 0
22 FT	23	26	17	13	7	7.5	7	7.5	78.9	47.0	47.0	47.0	7	12	73.0	7	12	49.0	7	7	6	6	69.4	190	202	214	7	6	67.0	5	12	6	7.5 0
24 FT	24	28	18	13	7	7	7	7.5	78.6	48.0	48.0	48.0	7	12	72.5	7	12	49.0	7	7	6	6.5	69.0	192	204	216	7	6	67.0	5	12	6	7 0
26 FT	26	29	18	13	7	7	7	7	78.1	50.0	50.0	50.0	7	12	71.5	7	12	49.0	7	6	6	6	68.5	193	205	217	8	7	73.0	5	12	6	7 0
28 FT	27	31	19	13	7	6.5	7	7	78.5	51.0	51.0	51.0	7	12	71.0	7	12	48.5	7	6.5	6	6	68.6	195	207	219	8	7	73.0	5	12	6	6.5 0
30 FT	28	32	19	13	7	6	7	6	78.1	52.0	52.0	52.0	7	12	70.5	7	12	48.5	7	6.5	6	6	68.5	196	208	220	8	7	73.0	5	12	6	6.5 0
32 FT	30	34	20	13	7	6	7	6.5	78.8	54.0	54.0	54.0	7	12	69.0	7	12	47.0	7	6.5	6	6	68.9	198	210	222	8	6.5	73.0	5	12	6	6.5 0
34 FT	31	35	20	13	7	6	7	6.5	76.3	55.0	55.0	55.0	8	15	76.0	8	15	54.0	7	6.5	6	6	66.4	199	211	223	8	6.5	73.0	5	12	6	6.5 0
36 FT	32	36	21	13	8	7.5	7	6.5	76.8	56.0	56.0	56.0	8	14	75.0	8	14	53.5	7	6	6	6	66.6	200	212	224	8	6	73.0	5	12	6	6 0
38 FT	33	37	21	13	8	7	7	6	76.8	57.0	57.0	57.0	8	14	74.0	8	14	53.0	7	6	6	6	66.6	201	213	225	8	6	73.0	5	12	6	6 0
40 FT	34	39		13	8	7	7	6	77.5	58.0	58.0	64.0	8	14	73.0	8	14	52.0	7	6	7	7.5	70.1	203	215	227	8	6	73.0	5	12	6	6 0
42 FT	35	40		13	8	7	7	6.5	78.1	59.0	59.0	65.0	8	13	72.5	8	13	51.0	7	6	7	7.5	70.4	204	216	228	9	7	79.0	5	12	7	7.5 0
44 FT	35	41	24	13	8	6	7	6	78.9	65.0	65.0	65.0	8	12	72.5	8	12	52.0	8	7.5	7	7	70.6	205	217	229	9	7	79.5	5	12	7	8 0
46 FT	36	42	25	13	8	6	7	6	79.5	66.0	66.0	66.0	8	12	72.0	8	12	51.0	8	7	7	7.5	70.9	206	218	230	9	7	79.5	5	12	7	8 0
48 FT	37	43		13	8	6.5	7	6	80.3	67.0	67.0	67.0	8	12	71.5	8	12	50.0	8	6.5	7	7.5	71.3	207	219	231	9	7	79.5	5	12	7	8 0
50 FT	38	45	27	13	8	6	7	6	81.1	68.0	68.0	68.0	8	12	71.0	8	12	49.0	8	7	7	7	71.8	209	221	233	9	6.5	79.5	5	12	7	8 0



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MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)

CONCRETE



DOUBLE BOX CULVERT

MEMBER THICKNESS BAR SIZE, SPACING & DIMENSIONS

SPAN (S): 15 FEET HEIGHT (HT): 14 THRU 16 FEET

DATE EFFECTIVE: DATE PREPARED:

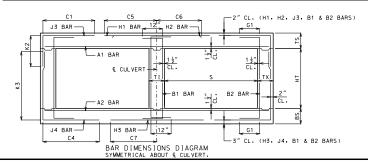
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703.47

SHEET NO. 25 OF 27

										SP.	AN (S) = 1	6 F	Ţ		HE	[GH]	Г (НТ) =	8 F1	r or	9 F	T OR	10 F	Τ									
		MEM									TOP SL	AB BARS												roM SLA	AB BAR	5						L BA		
DESIGN	1	THICK	NES	3	A1	BARS			J3	BARS				H1 BA	RS		H2 BA	RS	A2	BARS			J4	BARS				нз ва	RS	В1	BARS	B2	2 BARS	
FILL	TS	BS	ТX	ΤI	SIZE	SPA.	SIZE	SPA.	C1	HT=8'	K2 HT=9'	HT=10'	SIZE	SPA.	C5	SIZE	SPA.	C6	SIZE	SPA.	SIZE	SPA.	C4	HT=8'	K3 HT=9'	HT=10	SIZE	SPA.	C7	SIZE	SPA.	SIZE	SPA. C	G1
1 FT	15	12	8	8	6	7.5	5	8	76.5	35.0	35.0	35.0	6	15	154.5	6	15	54.0	5	6	6	7	66.9	104	116	128	7	7	72.5	5	12	5	12 1	12
2 FT	17	13	8	8	6	7	5	6.5	76.5	37.0	37.0	37.0	6	14	154.5	6	14	50.0	5	6	5	6	56.4	105	117	129	7	7	71.5	5	12	5	12 1	12
4 FT	13	13	8	8	6	6.5	6	7	55.6	33.0	33.0	33.0	7	14	97.0	7	14	45.5	5	6	5	6	49.6	105	117	129	7	6	71.0	5	12	5	12 1	12
6 FT	14	14	8	8	6	7	5	6	47.1	34.0	34.0	34.0	7	14	82.0	7	14	44.0	6	8	5	6	45.1	106	118	130	7	6	70.5	5	12	5	12 1	12
8 FT	15	16	8	8	6	7.5	5	6	48.4	35.0	35.0	35.0	7	13	84.0	7	13	51.0	6	7	5	7	41.9	108	120	132	7	6	70.0	5	12	5	11 (0
10 FT	16	17	8	8	6	7	6	8	49.6	36.0	36.0	36.0	7	12	81.5	7	12	50.5	6	7	5	6.5	39.9	109	121	133	7	6	69.5	5	12	5		0
12 FT	18	19	8	8	6	7	6	7.5	47.5	38.0	38.0	38.0	7	12	80.0	7	12	50.0	6	6	5	6	38.6	111	123	135	7	6	69.5	5	12	5		0
14 FT	19	20	8	8	6	6.5	6	7	46.0	39.0	39.0	43.0	7	12	79.0	7	12	49.5	6	6	6	7.5	40.5	112	124	136	7	6	69.5	5	12	5	9.5	0
16 FT	21	22	8	8	6	6	6	7	44.9	45.0	45.0	45.0	7	12	78.0	7	12	49.5	7	7.5	6	7	39.9	114	126	138	7	6	69.5	5	12	5	8.5	0
18 FT	22	23	9	8	6	6	6	7.5	45.1	42.0	42.0	42.0	8	15	85.0	8	15	57.0	7	6.5	5	6	36.8	115	127	139	8	6.5	75.5	5	12	5	8.5	0
20 FT	24	25	9	8	7	7.5	6	7	44.4	48.0	48.0	48.0	8	15	84.0	8	15	57.0	7	7	6	7	39.4	117	129	141	8	7	75.5	5	12	5	8.5	0
22 FT	25	27	10	8	7	7	6	7.5	45.0	45.0	45.0	49.0	8	14	83.5	8	14	56.5	7	6.5	6	7	39.5	119	131	143	8	7	75.5	5	12	5	8	0
24 FT	27	29	10	8	7	6.5	6	6.5	44.5	51.0	51.0	51.0	8	14	82.5	8	14	56.5	7	6.5	6	6.5	39.3	121	133	145	8	7	75.0	5	12	5		0
26 FT	28	31	11	8	7	6	6	7.5	45.3	52.0	52.0	52.0	8	14	81.5	8	14	56.0	7	6.5	6	7	39.5	123	135	147	8	7	75.0	5	12	5		0
28 FT	30	32	11	8	7	6	6	7	44.9	54.0	54.0	54.0	8	14	80.5	8	14	56.0	7	6.5	6	6.5	39.6	124	136	148	8	7	75.0	5	12	5		0
30 FT	31	34	11	8	8	7.5	6	6	44.9	55.0	55.0	55.0	8	14	79.5	8	14	55.5	7	6.5	6	6	39.6	126	138	150	8	6.5	75.0	5	12	5		0
32 FT	32	35	12	8	8	7	6	7	45.8	56.0	56.0	56.0	8	14	78.5	8	14	55.0	7	6	6	6.5	40.0	127	139	151	8	6.5	75.0	5	12	5		0
34 FT	33	36	12	8	8	7	6	7	45.3	57.0	57.0	57.0	8	14	77.5	8	14	54.5	7	6	6	6.5	39.3	128	140	152	8	6	75.0	5	12	5		0
36 FT	35	38	12	8	8	6.5	6	6.5	45.3	59.0	59.0	59.0	8	13	75.0	8	13	52.0	7	6	6	6	39.3	130	142	154	8	6	75.0	5	12	5		0
38 FT	36	39	12	8	8	6.5	6	6.5	45.3	60.0	60.0	60.0	8	13	74.0	8	13	51.5	7	6	6	6	39.3	131	143	155	8	6	75.0	5	12	5		0
40 FT	37	41	12	8	8	6.5	6	6	45.3	61.0	61.0	61.0	8	12	73.5	8	12	50.5	7	6	7	6.5	42.5	133	145	157	9	7	80.5	5	11	5		0
42 FT	38	42	12	8	8	6	6	6	45.3	62.0	62.0	62.0	8	12	73.0	8	12	50.0	7	6	7	6	42.6	134	146	158	9	7	80.5	5	7	6		0
44 FT	39	43	13	9	8	6	6	6	45.8	63.0	63.0	63.0	8	12	73.5	8	12	50.5	8	7.5	7	6.5	43.1	135	147	159	9	7	81.0	5	12	5		0
46 FT	40	44	13	9	8	6	7	7	50.8	70.0	70.0	70.0	8	12	73.0	8	12	49.5	8	7.5	7	6.5	43.4	136	148	160	9	6.5	80.5	5	12	6		0
48 FT	41	45	13	9	9	7.5	7	7	50.8	71.0	71.0	71.0	9	15	80.5	9	15	56.5	8	7	7	6.5	43.5	137	149	161	9	6.5	80.5	5	12	6		0
50 FT	42	46	13	9	9	7	7	6.5	50.8	72.0	72.0	72.0	9	14	80.0	9	14	56.0	8	7	7	6	43.8	138	150	162	9	6.5	80.5	5	9.5	6	7 1	0
										CDA	V (C)	4.0	СТ			115.3	CLIT	/ IIIT >		4 5	- 00	4.0	F.T. OF	17 [- т									_

										SPA	N (S)	= 16	FT			HE	IGHT	(HT)	= '	11 FI	r or	12	FT OF		FT									
		MEM	BER								TOP SL	AB BAR											BOTT	OM SL	AB BAR	ŝ						L BA		
DESIGN	1	THICK	NES:	S	A1	BARS			J3	BARS				н1 ВА	RS.		H2 B4	\RS	A2	BARS			J4	BARS				нз ва	RS	B1 I	BARS	Ba	2 BARS	S
FILL	TS	BS	TX	ΤI	SIZE	SPA.	SIZE	SPA.	C1	HT=11	K2 'HT=12'	HT=13'	SIZE	SPA.	C5	SIZE	SPA.	C6	SIZE	SPA.	SIZE	SPA.	C4	HT=11	K3 HT=12′	HT=13	SIZE	SPA.	C7	SIZE	SPA.	SIZE	SPA.	G1
1 FT	15	13	9	10	6	7.5	5	6	77.5	35.0	35.0	35.0	6	15	155.5	6	15	53.5	5	6	6	6	89.5	141	153	165	6	6	70.0	5	11.5	5	8.5	12
2 FT	17	14	9	10	6	7.5	5	6.5	77.5	37.0	37.0	37.0	6	14	155.5	6	14	50.0	6	8	6	6.5	79.8	142	154	166	6	6	69.5	5	12	5	8.5	12
4 FT	13	13	10	10	6	6.5	6	7	76.9	33.0	37.0	37.0	7	15	96.5	7	15	46.0	5	6	6	6.5	70.0	141	153	165	7	6	71.5	5	11	5	8.5	12
6 FT	13	14	10	10	6	7	6	7	65.3	33.0	37.0	37.0	7	13	79.5	7	13	44.0	6	8	6	6.5	64.5	142	154	166	7	6	71.0	5	12	5	8	12
8 FT	14	16	10	10	6	7	6	6.5	60.3	34.0	34.0	38.0	7	13	75.0	7	13	43.0	6	7	6	7	60.6	144	156	168	7	6	70.5	5	12	5	8	0
10 FT	16	17	10	10	6	7	6	6.5	63.1	36.0	40.0	40.0	7	13	81.5	7	13	51.0	6	7	6	6.5	57.8	145	157	169	7	6	70.0	5	12	5	8	С
12 FT	17	19	11	10	6	7	6	6.5	62.3	37.0	37.0	41.0	7	12	80.0	7	12	50.5	6	6	6	7.5	56.5	147	159	171	7	6	70.0	5	12	5	7.5	(
14 FT	19	21	12	10	6	6.5	6	7	61.5	39.0	39.0	43.0	7	12	78.5	7	12	50.5	7	8	6	8	55.8	149	161	173	7	6	70.0	5	12	5	7	
16 FT	20	22	12	10	6	6.5	6	6.5	60.3	40.0	40.0	44.0	7	12	78.0	7	12	50.0	7	7.5	6	7	54.6	150	162	174	7	6	70.0	5	12	5	7	Г
18 FT	22	24	12	10	6	6	6	6	59.3	42.0	46.0	46.0	7	12	77.0	7	12	50.0	7	7	6	6.5	54.0	152	164	176	7	6	69.5	5	12	5	7	Г
20 FT	23	25	13	10	7	7.5	6	6	59.1	43.0	43.0	47.0	8	15	84.5	8	15	57.5	7	6.5	6	7	53.6	153	165	177	8	7	75.5	5	12	5	6.5	Г
22 FT	25	27	13	10	7	7	6	6	58.4	45.0	45.0	49.0	8	15	83.5	8	15	57.5	7	6.5	6	7	53.1	155	167	179	8	7	75.5	5	12	5	6.5	Г
24 FT	27	29	14	10	7	6.5	6	6	58.6	51.0	51.0	51.0	8	15	82.5	8	15	57.0	7	6.5	6	7.5	53.3	157	169	181	8	7	75.5	5	12	5	6	Г
26 FT	28	31	14	10	7	6.5	6	6	58.3	52.0	52.0	52.0	8	14	82.0	8	14	57.0	7	6.5	6	7.5	52.9	159	171	183	8	7	75.5	5	12	5	6	
28 FT	30	33	15	10	7	6	6	6	58.8	54.0	54.0	54.0	8	15	80.5	8	15	56.5	7	6.5	6	7	53.3	161	173	185	8	6.5	75.5	5	12	6	8	-
30 FT	31	34	15	10	8	7.5	7	8	63.5	55.0	55.0	55.0	8	15	79.5	8	15	56.0	7	6	6	7	53.1	162	174	186	8	6.5	75.5	5	12	6	8	1
32 FT	32	35	15	10	8	7.5	7	7	63.3	56.0	56.0	56.0	8	14	79.0	8	14	55.5	7	6	6	6.5	53.0	163	175	187	8	6.5	75.5	5	12	6	8	1
34 FT	33	37	16	10	8	7	7	7.5	64.0	57.0	57.0	57.0	8	14	77.5	8	14	55.0	7	6	6	6.5	53.5	165	177	189	8	6	75.5	5	12	6	8	1
36 FT	34	38	16	10	8	7	7	7.5	62.4	58.0	58.0	58.0	8	14	76.5	8	14	54.0	7	6	6	6	51.9	166	178	190	8	6	75.5	5	12	6	8	1
38 FT	35	40	16	10	8	6.5	7	7	62.4	59.0	59.0	59.0	8	13	75.0	8	13	53.5	7	6	6	6	52.0	168	180	192	9	7	81.5	5	12	6	8	
40 FT	36	41	17	10	8	6	7	7.5	63.1	60.0	60.0	66.0	8	12	74.5	8	12	52.5	8	7.5	7	8	55.5	169	181	193	9	7	81.5	5	12	6	7.5	
42 FT	38	42	17	10	8	6	7	7.5	62.9	62.0	62.0	68.0	8	12	73.5	8	12	50.0	8	7.5	7	7.5	55.8	170	182	194	9	7	81.5	5	12	6	7.5	Г
44 FT	39	43	18	10	8	6	7	7.5	63.8	63.0	63.0	69.0	8	12	73.0	8	12	49.0	8	7	7	7.5	56.1	171	183	195	9	7	81.5	5	12	6	7	
46 FT	40	44	18	10	8	6	7	7.5	63.6	70.0	70.0	70.0	8	12	72.0	8	12	48.5	8	6.5	7	7	56.3	172	184	196	9	6.5	81.5	5	12	6	7	(
48 FT	40	46	19	10	8	6	7	7	64.8	70.0	70.0	70.0	8	12	72.0	8	12	49.0	8	7	7	7	56.6	174	186	198	9	6.5	81.5	5	12	6	6.5	(
50 FT	41	47	19	10	9	7.5	7	6.5	64.6	71.0	71.0	71.0	8	12	71.5	8	12	48.5	8	7	7	6.5	56.9	175	187	199	9	6	81.5	5	12	6	6.5	1



SPECIAL DESIGNS ARE REQUIRED WHEN THE DESIGN FILL IS LESS THAN 1 FOOT OR GREATER THAN 50 FEET.

DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.

DESIGN FILLS ARE MEASURED FROM THE TOP OF TOP SLAB TO THE TOP OF EARTH FILL OR ROADWAY.

CULVERTS MEET STRENGTH AND SERVICEABILITY REQUIREMENTS FOR THE DESIGN VEHICULAR LIVE LOAD HL-93 MINUS THE LANE LOAD.



MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)



CONCRETE DOUBLE BOX CULVERT

MEMBER THICKNESS BAR SIZE, SPACING & DIMENSIONS

SPAN (S): 16 FEET HEIGHT (HT): 8 THRU 13 FEET

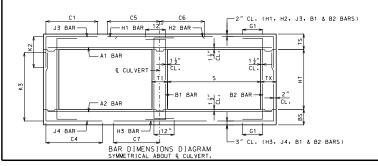
DATE EFFECTIVE: DATE PREPARED:

9/8/2011

703.47

SHEET NO. 26 OF 27

										SPA		= 16				HE I	GHT	(HT)	= 1	14 FT	OR	15											
	١.	MEM		_							TOP SL.	AB BARS												OM SLA	B BAR	S	_				WAL		
DESIGN		THICH	(NE 2	5	A1	BARS			J3	BARS				H1 BA	RS		H2 BA	RS	A2	BARS			J4	BARS				нз ва	RS	B1	BARS	B2	BARS
FILL	TS	BS	ТX	ΤI	SIZE	SPA.	SIZE	SPA.	C1	HT=14	K2 HT=15'	HT=16'	SIZE	SPA.	C5	SIZE	SPA.	C6	SIZE	SPA.	SIZE	SPA.	C4	HT=14'	K3 HT=15'	HT=16′	SIZE	SPA.	C7	SIZE	SPA.	SIZE	SPA. G1
1 FT	15	13	12	13	6	7.5	6	8	82.9	35.0	35.0	39.0	6	15	160.5	6	15	53.0	5	6	6	7	101.1	177	189	201	6	6	70.5	5	10	5	7 12
2 FT	17	14	12	13	6	7.5	6	8.5	82.9	37.0	37.0	41.0	6	14	160.5	6	14	50.0	6	8	6	7	95.1	178	190	202	7	7	73.0	5	12	5	7 12
4 FT	13	13	12	13	6	7	6	7	99.8	37.0	37.0	37.0	7	15	94.0	7	15	46.0	6	8.5	6	6	86.1	177	189	201	7	6	72.0	5	11	5	7 12
6 FT	13	15	12	13	6	7	6	6.5	82.6	37.0	37.0	37.0	7	14	77.5	7	14	44.5	6	7.5	6	6.5	82.5	179	191	203	7	6	71.5	5	12	5	7 12
8 FT	14	16	13	13	6	7.5	6	6.5	76.6	38.0	38.0	38.0	7	13	74.5	7	13	44.0	6	7	6	6.5	77.6	180	192	204	7	6	71.0	5	12	5	6.5 0
10 FT	15	18	13	13	6	6.5	6	6	79.5	39.0	39.0	39.0	7	13	80.5	7	13	51.5	6	6.5	6	6	75.6	182	194	206	7	6	71.0	5	12	5	6.5 0
12 FT	17	19		13	6	7	6	6	77.8	41.0	41.0	41.0	7	13	79.5	7	13	51.5	6	6	6	6	73.1	183	195	207	7	6	70.5	5	12	5	6 0
14 FT	18	21	15	13	6	7	6	6	76.3	42.0	42.0	42.0	7	12	78.5	7	12	51.0	7	8	6	6	71.8	185	197	209	7	6	70.5	5	12	6	8 0
16 FT	20	22	15	13	6	6.5	7	7.5	79.9	44.0	44.0	44.0	7	12	78.0	7	12	51.0	7	7.5	6	6	70.3	186	198	210	7	6	70.0	5	12	6	8 0
18 FT	22	24	15	13	6	6	7	7	78.8	46.0	46.0	52.0	7	12	77.5	7	12	51.0	7	7	7	7	72.4	188	200	212	7	6	70.0	5	12	6	8 0
20 FT	23	25	16	13	7	7.5	7	7	78.0	47.0	47.0	53.0	8	15	85.0	8	15	58.5	7	6	7	7.5	71.4	189	201	213	8	7	76.0	5	12	6	8 0
22 FT	25	27	17	13	7	7	7	7.5	77.8	49.0	49.0	49.0	7	12	76.0	7	12	50.5	7	6	6	6	68.0	191	203	215	8	7	76.0	5	12	6	7.5 0
24 FT	26	29	17	13	7	7	7	7	76.9	50.0	50.0	56.0	8	15	83.5	8	15	58.5	7	6.5	7	7.5	70.4	193	205	217	8	7	76.0	5	12	6	7.5 0
26 FT	28	31	18	13	7	6.5	7	7	76.9	52.0	52.0	52.0	8	15	82.5	8	15	58.0	7	6.5	6	6	67.1	195	207	219	8	7	76.5	5	12	6	7 0
28 FT	29	33	19	13	7	6	7	7	77.1	53.0	53.0	53.0	8	15	82.0	8	15	58.0	7	6	6	6	67.1	197	209	221	8	6.5	76.5	5	12	6	6.5 0
30 FT	31	34	19	13	8	7.5	7	6.5	76.8	55.0	55.0	55.0	8	15	80.5	8	15	57.0	7	6	6	6	67.0	198	210	222	8	6.5	76.0	5	12	6	6.5 0
32 FT	32	36	20	13	8	7.5	7	6.5	77.3	56.0	56.0	56.0	8	14	79.5	8	14	56.5	7	6	6	6	67.3	200	212	224	8	6	76.5	5	12	6	6.5 0
34 FT	33	37	21	13	8	7	7	6.5	77.6	57.0	57.0	57.0	8	14	78.5	8	14	55.5	7	6	6	6	67.3	201	213	225	8	6	76.5	5	12	6	6 0
36 FT	34	38	21	13	8	7	7	6.5	75.5	58.0	58.0	58.0	8	14	77.5	8	14	55.0	8	7	6	6	64.9	202	214	226	8	6	76.5	5	12	6	6 0
38 FT	35	40	21	13	8	6.5	7	6	75.5	59.0	59.0	59.0	8	13	76.5	8	13	54.0	8	7.5	6	6	65.1	204	216	228	9	7	82.0	5	12	6	6 0
40 FT	36	41	22	13	8	6.5	7	6	76.1	66.0	66.0	66.0	8	13	75.5	8	13	53.5	8	7.5	7	7.5	68.5	205	217	229	9	7	82.0	5	12	6	6 0
42 FT	37	42	23	13	8	6.5	7	6.5	76.9	67.0	67.0	67.0	8	12	75.0	8	12	52.5	8	6.5	7	7.5	68.8	206	218	230	9	7	82.5	5	12	7	7.5 0
44 FT	38	44	24	13	8	6	1	6	77.6	68.0	68.0	68.0	8	12	74.5	8	12	52.0	8	7	7	7	69.4	208	220	232	9	6.5	82.5	5	12	7	7.5 0
46 FT	39	45	25	13	8	6	7	6	78.4	69.0	69.0	69.0	8	12	74.0	8	12	51.0	8	7	7	7	69.8	209	221	233	9	6.5	82.5	5	12	7	7.5 0
48 FT	40	46	26 27	13	8	7.5	7	6	79.1	70.0	70.0	70.0	8	12	73.5 73.0	8	12	50.0 49.5	8	6.5	7	6.5	70.1	210	222	234	9	6.5	82.5	5	12	7	8 0
100 FT	141	141	61	1 1 2	J	1.5		١ ٥	13.9	11.0	11.0	11.0	٥	12	13.0	8	12	43.3		0	- /	0.5	10.5	211	443	233	1 3	١ ٥	02.5	3	12		_ 0 0



SPECIAL DESIGNS ARE REQUIRED WHEN THE DESIGN FILL IS LESS THAN 1 FOOT OR GREATER THAN 50 FEET.

DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.

DESIGN FILLS ARE MEASURED FROM THE TOP OF TOP SLAB TO THE TOP OF EARTH FILL OR ROADWAY.

CULVERTS MEET STRENGTH AND SERVICEABILITY REQUIREMENTS FOR THE DESIGN VEHICULAR LIVE LOAD HL-93 MINUS THE LANE LOAD.



MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)



CONCRETE DOUBLE BOX CULVERT

MEMBER THICKNESS BAR SIZE, SPACING & DIMENSIONS

SPAN (S): 16 FEET HEIGHT (HT): 14 THRU 16 FEET

DATE EFFECTIVE: DATE PREPARED:

9/8/2011

703.47

SHEET NO. 27 OF 27

LAYING OUT TRANVERSE JOINTS UNIESS SHOWN ON BRIDGE PLANS

USE A TRANSVERSE JOINT WHEN BARREL LENGTH IS OVER 80 FEET.
USE ADDITIONAL JOINTS TO LIMIT CUT SECTION LENGTH AND END
SECTION BARREL LENGTH MEASURED ALONG CENTERLINE OF CULVERT TO
50 FEET.

MINIMUM END SECTION LENGTH SHALL BE 3 FEET MEASURED ALONG THE SHORTEST WALL FROM THE INSIDE FACE OF HEADWALL TO THE TRANSVERSE JOINT.

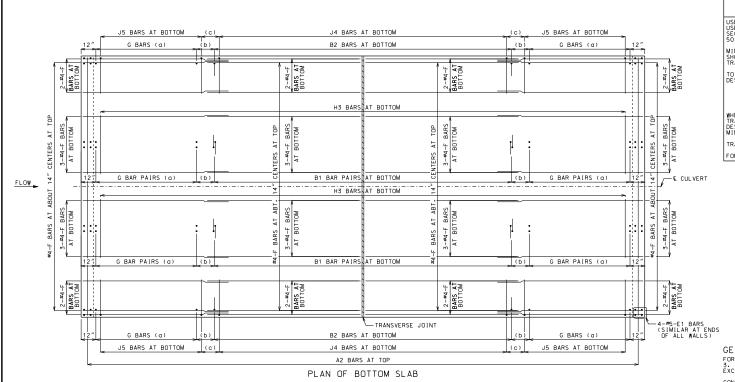
TO AVOID LOCATING TRANSVERSE JOINTS UNDER A TRAVELED WAY WITH DESIGN FILLS 2 FEET OR LESS THE FOLLOWING SHALL APPLY:

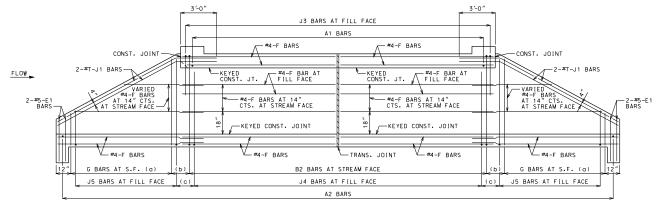
BARREL LENGTH UP TO 90 FEET WITHOUT A TRANSVERSE JOINT CUT SECTION LENGTHS UP TO 60 FEET

WHEN BARREL AND CUT SECTION LENGTH RESTRICTIONS REQUIRE TRANSVERSE JOINTS TO BE LOCATED UNDER A TRAVELED WAY WITH DESION FILLS 2 FEET OR LESS. THE JOINTS SHALL BE LOCATED TO MINIMIZE THE LENGTH OF JOINT UNDER THE TRAVELED WAY.

TRAVELED WAY IS THE ROADWAY WIDTH MINUS SHOULDER WIDTHS.

FOR CUT SECTION DETAILS, SEE 703.86.





ELEVATION OF EXTERIOR WALL J1 BARS MAY BE BENT IN FIELD OR SHOP.

GENERAL NOTES:

FOR SECTIONS THRU BARREL. WINGS AND HEADWALLS, SEE SHEET 3 OF 3. FOR BAR SIZES. SPACING AND DIMENSIONS OF ALL REINFORCEMENT EXCEPT JS BARS. SEE 703.87. FOR JS BARS. SEE 703.37.

DRAWING NOT TO SCALE. FOLLOW DIMENSIONS.

MINIMUM CLEARANCE TO REINFORCING STEEL SHALL BE 15".

LAP LONGITUDINAL BARS A MINIMUM OF 23" AT SPLICES.

BEVELED HEADWALL SHALL BE LOCATED AT UPSTREAM END.

(a) SAME SIZE AND SPACING AS ADJACENT B BARS

(b) VARIES, 12" MAXIMUM

(c) J4 BAR SPACING

MODOT m

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)



CONCRETE TRIPLE BOX CULVERT

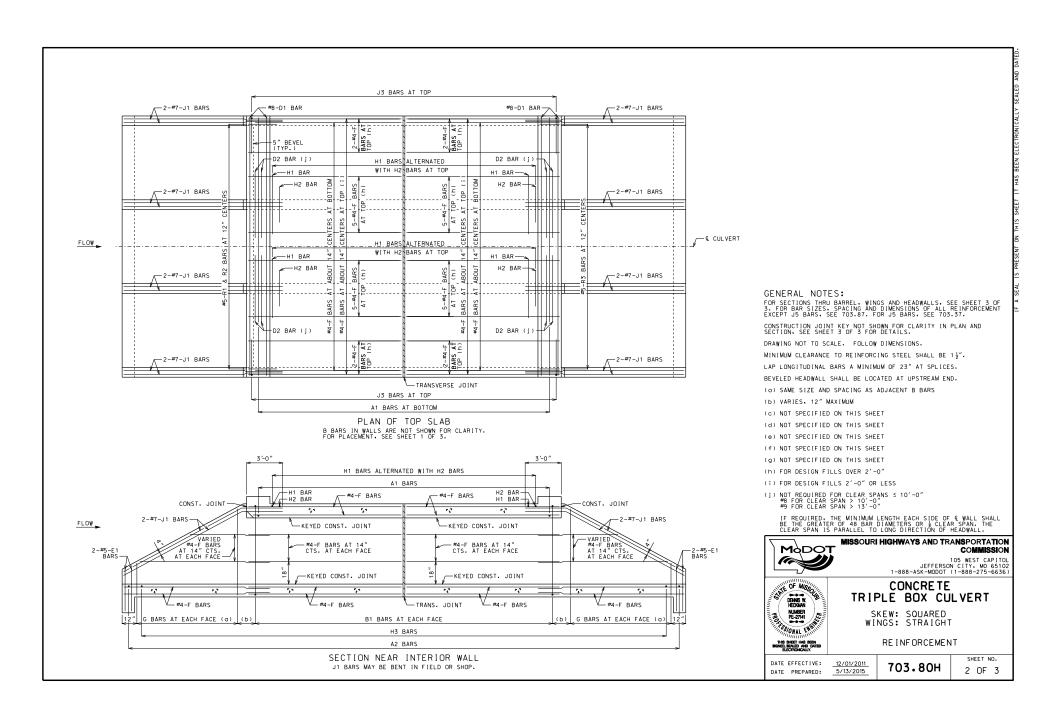
SKEW: SQUARED WINGS: STRAIGHT

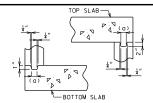
REINFORCEMENT

DATE EFFECTIVE: 12/01/2011 DATE PREPARED:

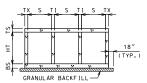
703.80H

SHEET NO. 1 OF 3

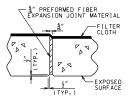




KEYED CONSTRUCTION JOINT (a) APPROXIMATELY ONE-THIRD OF WALL THICKNESS



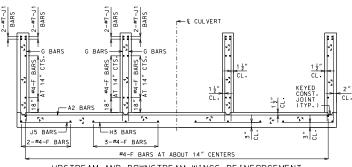
GRANULAR BACKFILL LIMITS AND MEMBER DIMENSIONS



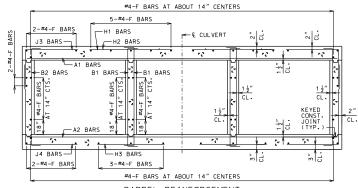
TRANSVERSE JOINT THRU BARREL PREFORMED FIBER EXPANSION JOINT MATERIAL IN ACCORDANCE WITH SEC 1057 SHALL BE SECURELY STITCHED TO ONE FACE OF THE CONCRETE WITH 10 GAGE COPPER WIRE OR 12 GAGE SOFT DRAWN GALVANIZED STEEL WIRE.

FILTER CLOTH 3 FEET IN WIDTH AND DOUBLE THICKNESS SHALL BE CENTERED ON TRANSVERSE JOINTS IN TOP SLAB AND SIDEWALLS WITH EDGES SEALED WITH MASTIC OR TWO SIDED TAPE. FILTER CLOTH SHALL BE A SUBSURFACE ORAINAGE GEOTEXTILE IN ACCORDANCE WITH SEC 1011. COST OF FUNISHING AND INSTALLING FILTER CLOTH WILL BE CONSIDERED COMPLETELY COVERED BY THE CONTRACT UNIT PRICE FOR DITHER ITEMS.

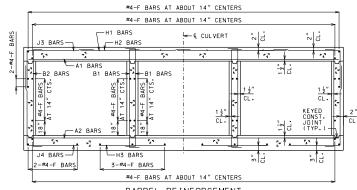
NEAR INTERIOR WALL



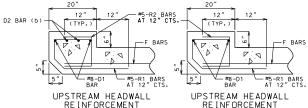
UPSTREAM AND DOWNSTREAM WINGS REINFORCEMENT



BARREL REINFORCEMENT FOR DESIGN FILLS OVER 2'-0"



BARREL REINFORCEMENT FOR DESIGN FILLS 2'-0" OR LESS



(b) NOT REQUIRED FOR CLEAR SPANS ≤ 10'-0" #8 FOR CLEAR SPAN > 10'-0" #9 FOR CLEAR SPAN > 13'-0"

NEAR MIDSPAN

D2 BAR (b) A . 4 #8-D1 BAR-

DOWNSTREAM HEADWALL DOWNSTREAM HEADWALL REINFORCEMENT NEAR INTERIOR WALL

IF D2 BARS ARE REQUIRED, THE MINIMUM LENGTH EACH SIDE OF & WALL SHALL BE THE GREATER OF 48 BAR DIAMETERS OR \$\frac{1}{2} CLEAR SPAN. THE CLEAR SPAN IS PARALLEL TO LONG DIRECTION OF HEADWALL.

REINFORCEMENT NEAR MIDSPAN

DRAWING NOT TO SCALE. FOLLOW DIMENSIONS.

MINIMUM CLEARANCE TO REINFORCING STEEL SHALL BE $1\frac{1}{2}$.

FOR MEMBER THICKNESS AND FOR BAR SIZES, SPACING AND DIMENSIONS OF ALL REINFORCEMENT EXCEPT J5 BARS, SEE 703.87. FOR J5 BARS, SEE 703.37.

BARREL AND WINGS SECTIONS ARE SYMMETRICAL ABOUT AND NORMAL TO © CULVERT. HEADWALL SECTIONS ARE NORMAL TO LONG DIRECTION OF HEADWALL.

GENERAL NOTES:



MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)



CONCRETE TRIPLE BOX CULVERT

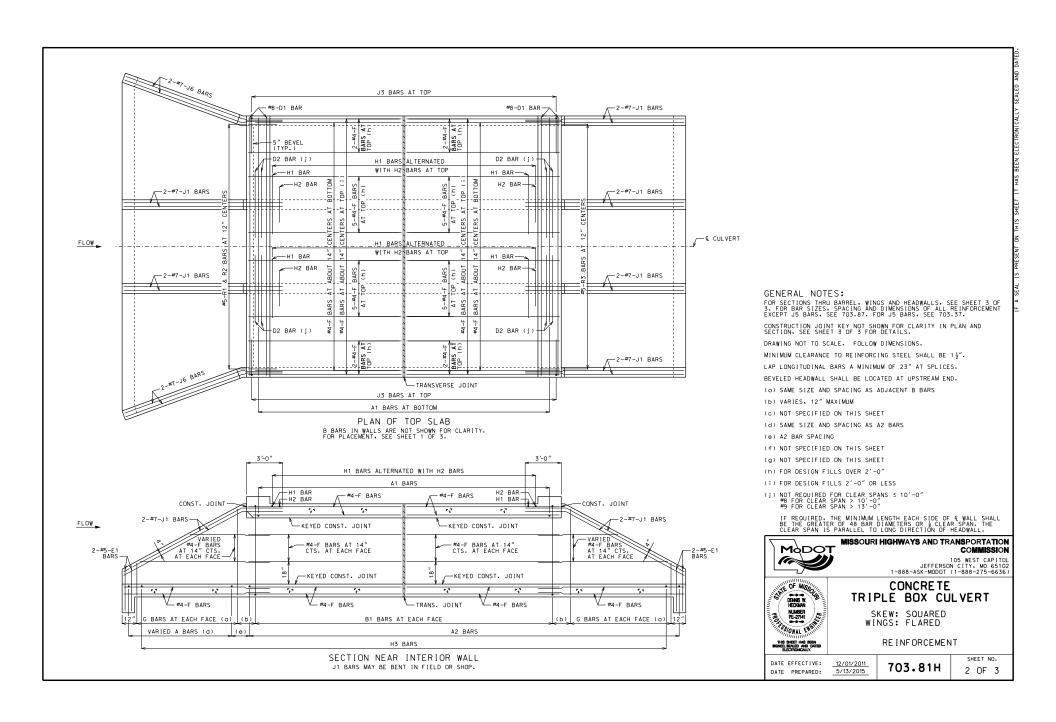
> SKEW: SQUARED WINGS: STRAIGHT

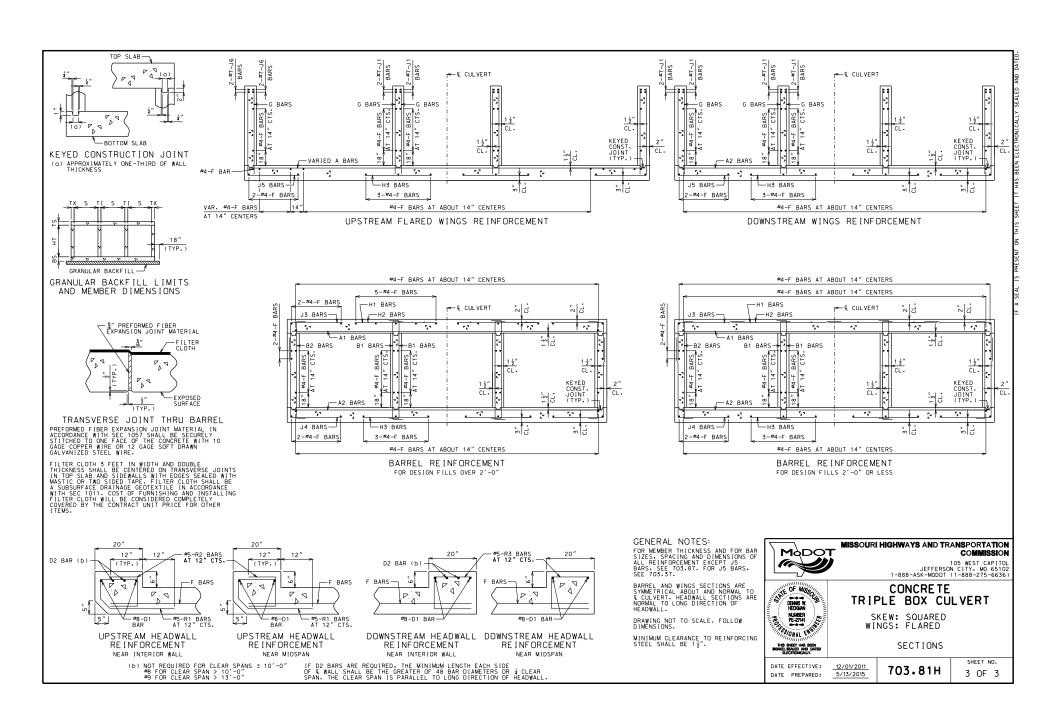
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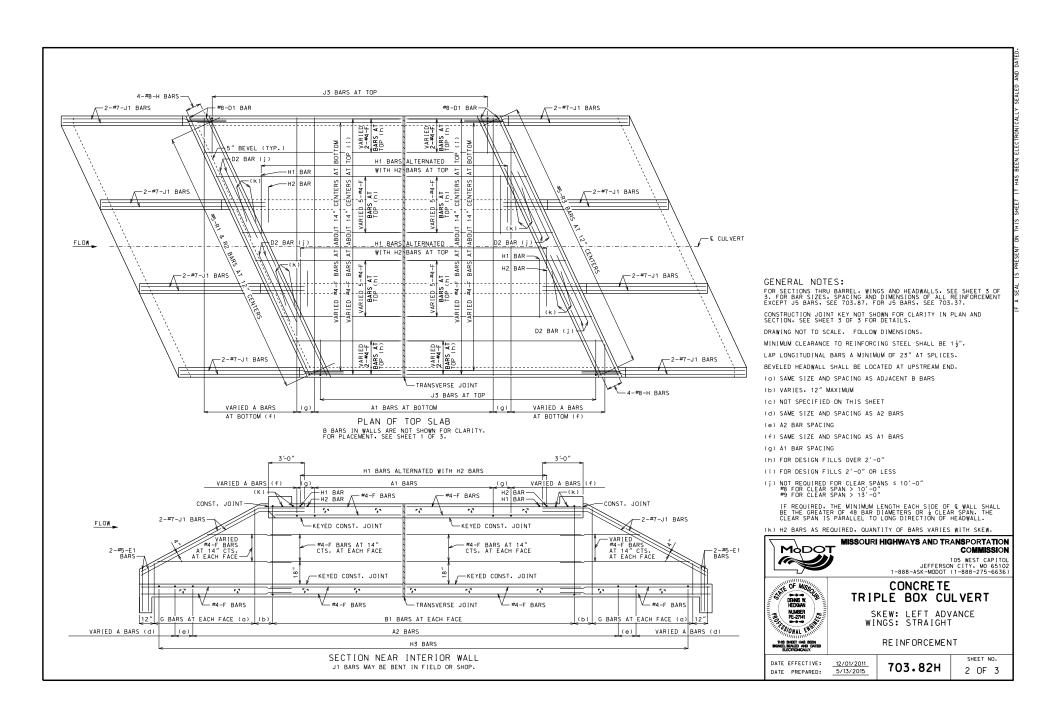
DATE EFFECTIVE: DATE PREPARED: 12/01/2011

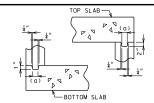
703.80H

SHEET NO. 3 OF 3

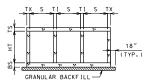




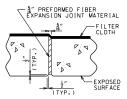




KEYED CONSTRUCTION JOINT (a) APPROXIMATELY ONE-THIRD OF WALL THICKNESS

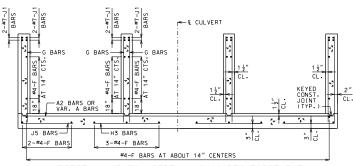


GRANULAR BACKFILL LIMITS AND MEMBER DIMENSIONS

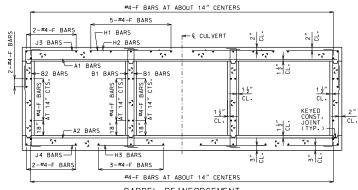


TRANSVERSE JOINT THRU BARREL PREFORMED FIBER EXPANSION JOINT MATERIAL IN ACCORDANCE WITH SEC 1057 SHALL BE SECURELY STITCHED TO ONE FACE OF THE CONCRETE WITH 10 GAGE COPPER WIRE OR 12 GAGE SOFT DRAWN GALVANIZED STEEL WIRE.

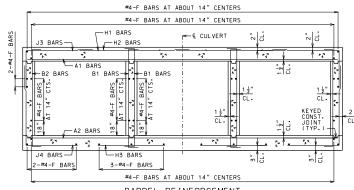
FILTER CLOTH 3 FEET IN WIDTH AND DOUBLE THICKNESS SHALL BE CENTERED ON TRANSVERSE JOINTS IN TOP SLAB AND SIDEWALLS WITH EDGES SEALED WITH MASTIC OR TWO SIDED TAPE. FILTER CLOTH SHALL BE A SUBSURFACE ORAINAGE GEOTEXTILE IN ACCORDANCE WITH SEC 1011. COST OF FUNISHING AND INSTALLING FILTER CLOTH WILL BE CONSIDERED COMPLETELY COVERED BY THE CONTRACT UNIT PRICE FOR DITHER ITEMS.



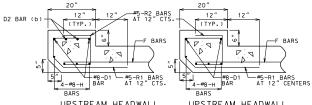
UPSTREAM AND DOWNSTREAM WINGS REINFORCEMENT



BARREL REINFORCEMENT FOR DESIGN FILLS OVER 2'-0"

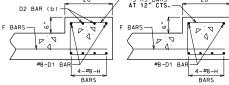


BARREL REINFORCEMENT FOR DESIGN FILLS 2'-0" OR LESS



UPSTREAM HEADWALL REINFORCEMENT NEAR INTERIOR WALL

UPSTREAM HEADWALL REINFORCEMENT NEAR MIDSPAN



DOWNSTREAM HEADWALL REINFORCEMENT NEAR INTERIOR WALL

DOWNSTREAM HEADWALL REINFORCEMENT NEAR MIDSPAN

GENERAL NOTES:

FOR MEMBER THICKNESS AND FOR BAR SIZES, SPACING AND DIMENSIONS OF ALL REINFORCEMENT EXCEPT J5 BARS, SEE 703.87. FOR J5 BARS, SEE 703.37.

BARREL AND WINGS SECTIONS ARE SYMMETRICAL ABOUT AND NORMAL TO © CULVERT. HEADWALL SECTIONS ARE NORMAL TO LONG DIRECTION OF HEADWALL.

DRAWING NOT TO SCALE. FOLLOW DIMENSIONS.

MINIMUM CLEARANCE TO REINFORCING STEEL SHALL BE $1\frac{1}{2}$.



MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)



CONCRETE TRIPLE BOX CULVERT

SKEW: LEFT ADVANCE WINGS: STRAIGHT

SECTIONS

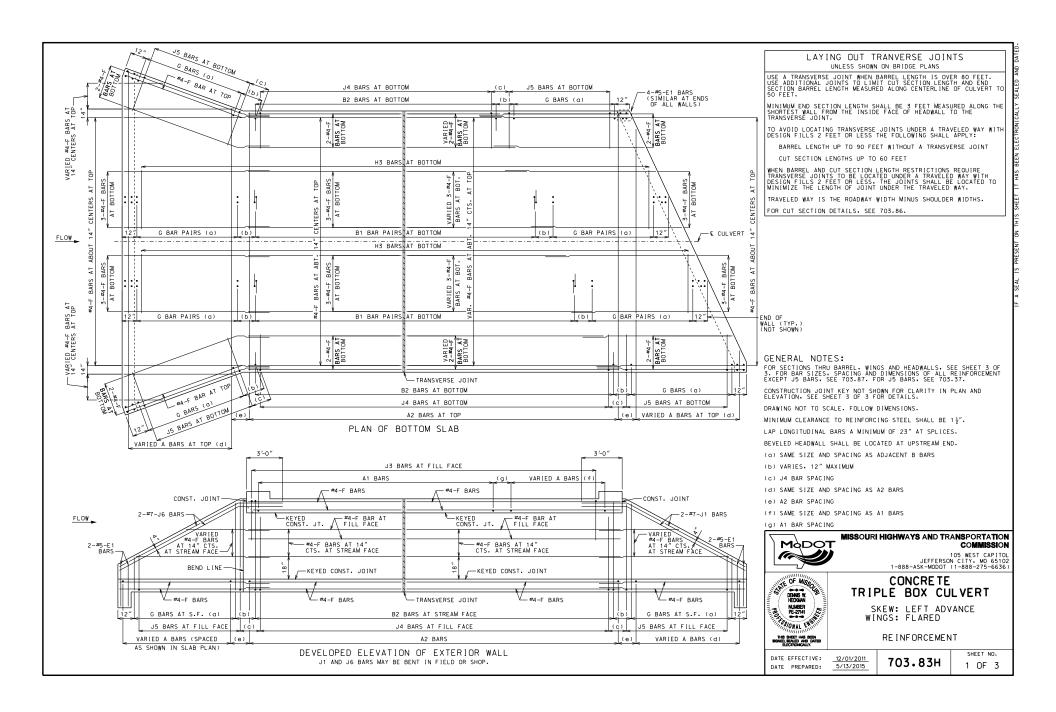
DATE EFFECTIVE: DATE PREPARED: 12/01/2011

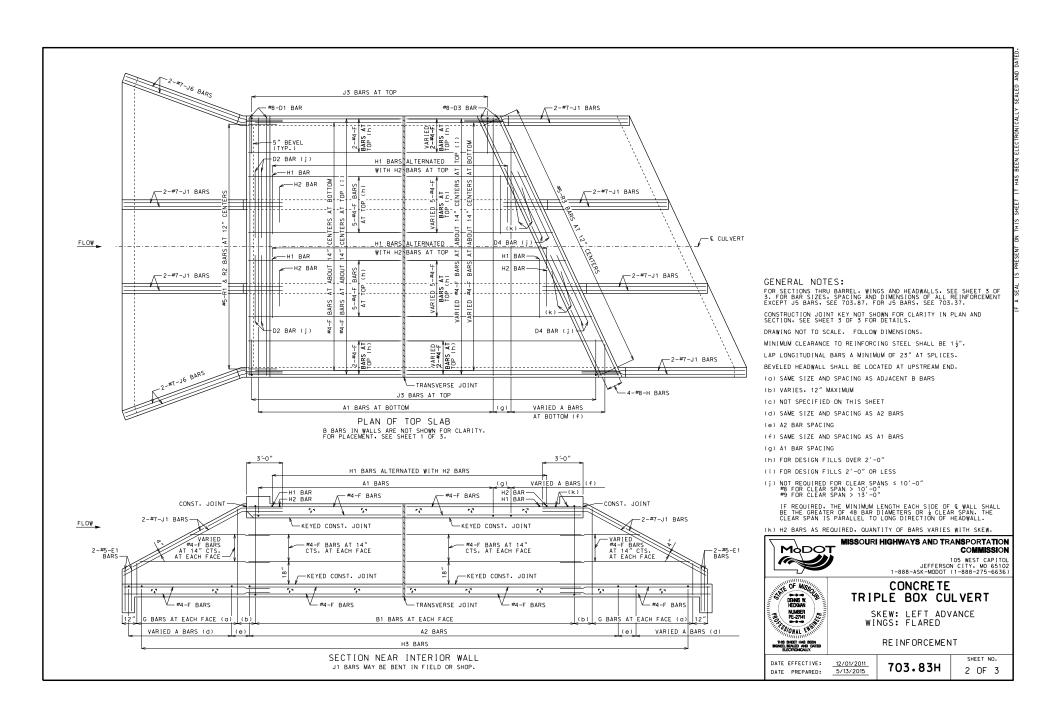
703.82H

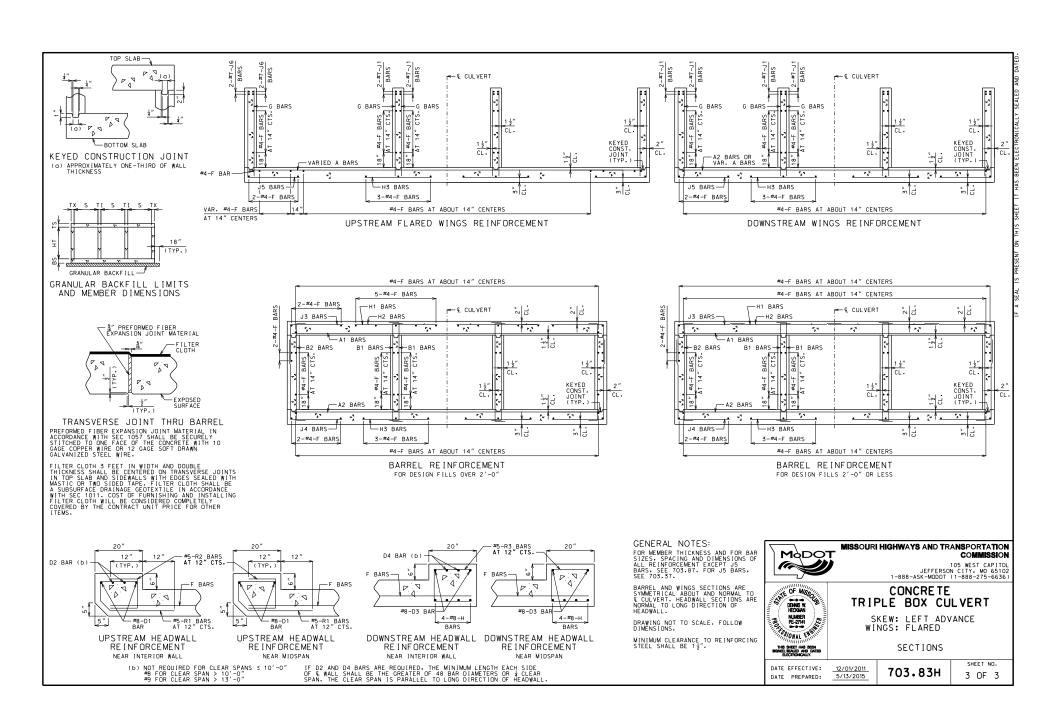
SHEET NO. 3 OF 3

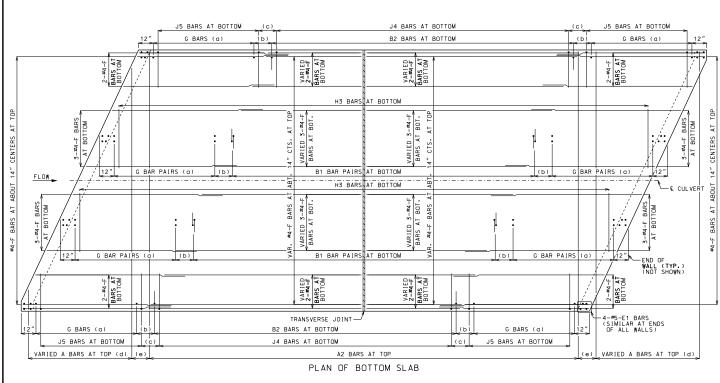
(b) NOT REQUIRED FOR CLEAR SPANS ≤ 10'-0" #8 FOR CLEAR SPAN > 10'-0" #9 FOR CLEAR SPAN > 13'-0"

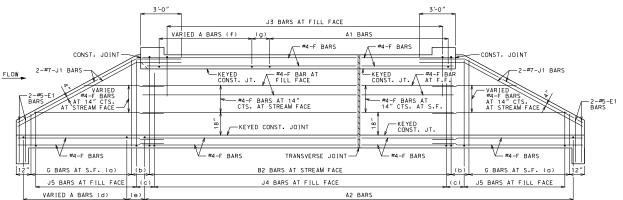
IF D2 BARS ARE REQUIRED. THE MINIMUM LENGTH EACH SIDE OF & WALL SHALL BE THE GREATER OF 48 BAR DIAMETERS OR \$\frac{1}{2}CLEAR SPAN. THE CLEAR SPAN IS PARALLEL TO LONG DIRECTION OF HEADWALL.











ELEVATION OF EXTERIOR WALL

J1 BARS MAY BE BENT IN FIELD OR SHOP.

LAYING OUT TRANVERSE JOINTS

UNIESS SHOWN ON BRIDGE PLANS

USE A TRANSVERSE JOINT WHEN BARREL LENGTH IS OVER 80 FEET.
USE ADDITIONAL JOINTS TO LIMIT CUT SECTION LENGTH AND END
SECTION BARREL LENGTH MEASURED ALONG CENTERLINE OF CULVERT TO
50 FEET.

MINIMUM END SECTION LENGTH SHALL BE 3 FEET MEASURED ALONG THE SHORTEST WALL FROM THE INSIDE FACE OF HEADWALL TO THE TRANSVERSE JOINT.

TO AVOID LOCATING TRANSVERSE JOINTS UNDER A TRAVELED WAY WITH DESIGN FILLS 2 FEET OR LESS THE FOLLOWING SHALL APPLY:

BARREL LENGTH UP TO 90 FEET WITHOUT A TRANSVERSE JOINT CUT SECTION LENGTHS UP TO 60 FEET

WHEN BARREL AND CUT SECTION LENGTH RESTRICTIONS REQUIRE TRANSVERSE JOINTS TO BE LOCATED UNDER A TRAVELED WAY WITH DESION FILLS 2 FEET OR LESS. THE JOINTS SHALL BE LOCATED TO MINIMIZE THE LENGTH OF JOINT UNDER THE TRAVELED WAY.

TRAVELED WAY IS THE ROADWAY WIDTH MINUS SHOULDER WIDTHS.

FOR CUT SECTION DETAILS, SEE 703.86.

GENERAL NOTES:

FOR SECTIONS THRU BARREL, WINGS AND HEADWALLS, SEE SHEET 3 OF 3. FOR BAR SIZES, SPACING AND DIMENSIONS OF ALL REINFORCEMENT EXCEPT JS BARS, SEE 703.87. FOR JS BARS, SEE 703.87. FOR JS BARS, SEE 703.87. FOR JS BARS, SEE 703.87.

CONSTRUCTION JOINT KEY NOT SHOWN FOR CLARITY IN PLAN AND ELEVATION, SEE SHEET 3 OF 3 FOR DETAILS.

DRAWING NOT TO SCALE. FOLLOW DIMENSIONS.

MINIMUM CLEARANCE TO REINFORCING STEEL SHALL BE 15%.

LAP LONGITUDINAL BARS A MINIMUM OF 23" AT SPLICES.

BEVELED HEADWALL SHALL BE LOCATED AT UPSTREAM END.

- (a) SAME SIZE AND SPACING AS ADJACENT B BARS
- (b) VARIES. 12" MAXIMUM
- (c) J4 BAR SPACING
- (d) SAME SIZE AND SPACING AS A2 BARS
- (e) A2 BAR SPACING
- (f) SAME SIZE AND SPACING AS A1 BARS
- (g) A1 BAR SPACING

MISSOURI HIGHWAYS AND TRANSPORTATION MODOT m

105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)



CONCRETE TRIPLE BOX CULVERT

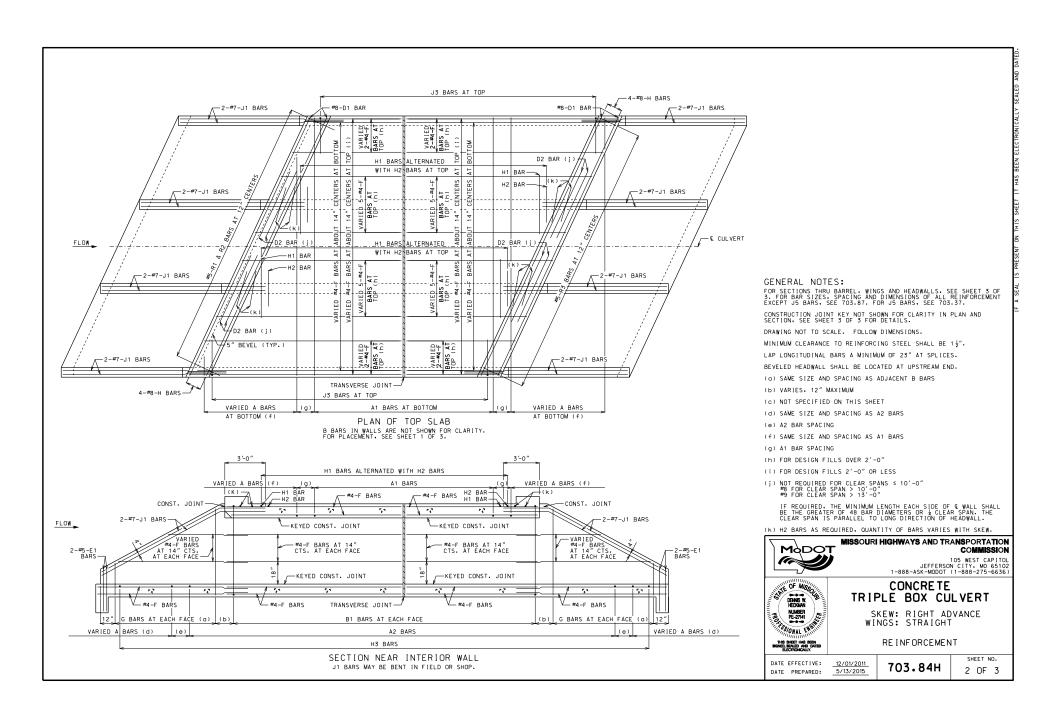
SKEW: RIGHT ADVANCE WINGS: STRAIGHT

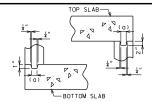
REINFORCEMENT

DATE EFFECTIVE: 12/01/2011 DATE PREPARED:

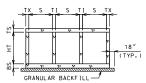
703.84H

SHEET NO. 1 OF 3

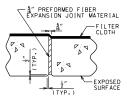




KEYED CONSTRUCTION JOINT
(a) APPROXIMATELY ONE-THIRD OF WALL
THICKNESS

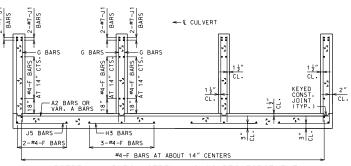


GRANULAR BACKFILL LIMITS AND MEMBER DIMENSIONS

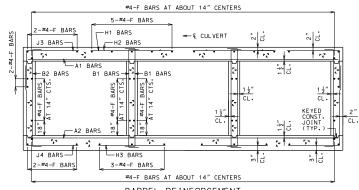


TRANSVERSE JOINT THRU BARREL PREFORMED FIBER EXPANSION JOINT MATERIAL IN ACCORDANCE WITH SEC 1057 SHALL BE SECURELY STITCHED TO ONE FACE OF THE CONCRETE WITH 10 GAGE COPPER WITH OR 12 GAGE SOFT DRAWN GALVANIZED STEEL WIRE

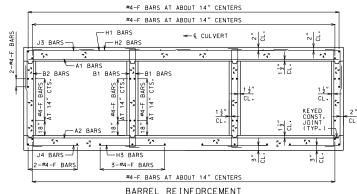
FILTER CLOTH 3 FEET IN WIDTH AND DOUBLE THICKNESS SHALL BE CENTERED ON TRANSVERSE JOINTS IN TOP SLAB AND SIDEWALLS WITH EDGES SEALED WITH MASTIC OR TWO SIDED TAPE. FILTER CLOTH SHALL BE A SUBSUFFACE DRAINAGE GEDTEXTILE IN ACCORDANCE WITH SEC 1011. COST OF FUNNISHING AND INSTALLING FILTER CLOTH WILL BE CONSIDERED COMPLETELY COVERED BY THE CONTRACT UNIT PRICE FOR OTHER ITEMS.



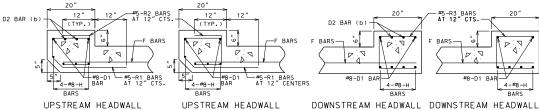
UPSTREAM AND DOWNSTREAM WINGS REINFORCEMENT



BARREL REINFORCEMENT FOR DESIGN FILLS OVER 2'-0"



FOR DESIGN FILLS 2'-0" OR LESS



UPSTREAM HEADWALL
REINFORCEMENT
NEAR INTERIOR WALL

UPSTREAM HEADWALL REINFORCEMENT NEAR MIDSPAN DOWNSTREAM HEADWA REINFORCEMENT NEAR INTERIOR WALL DOWNSTREAM HEADWAL
REINFORCEMENT
NEAR MIDSPAN

GENERAL NOTES:

FOR MEMBER THICKNESS AND FOR BAR SIZES, SPACING AND DIMENSIONS OF ALL REINFORCEMENT EXCEPT J5 BARS, SEE 703.87. FOR J5 BARS, SEE 703.37.

BARREL AND WINGS SECTIONS ARE SYMMETRICAL ABOUT AND NORMAL TO © CULVERT. HEADWALL SECTIONS ARE NORMAL TO LONG DIRECTION OF HEADWALL.

DRAWING NOT TO SCALE. FOLLOW DIMENSIONS.

MINIMUM CLEARANCE TO REINFORCING STEEL SHALL BE 1 $\frac{1}{2}$.



MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODDT (1-888-275-6636)



CONCRETE TRIPLE BOX CULVERT

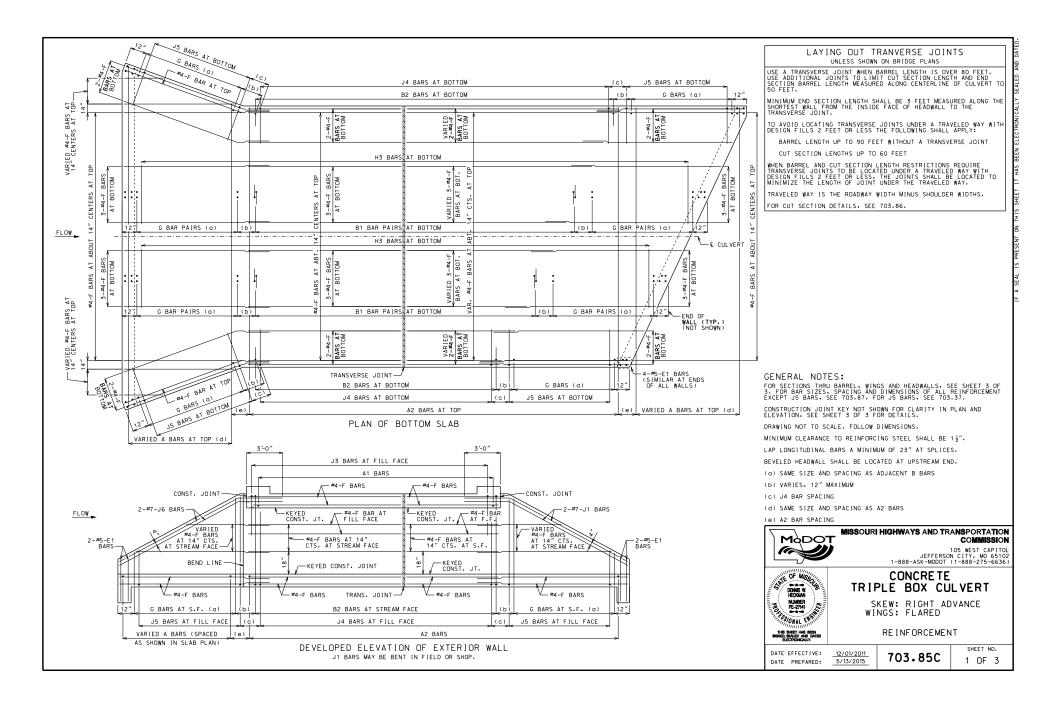
SKEW: RIGHT ADVANCE WINGS: STRAIGHT

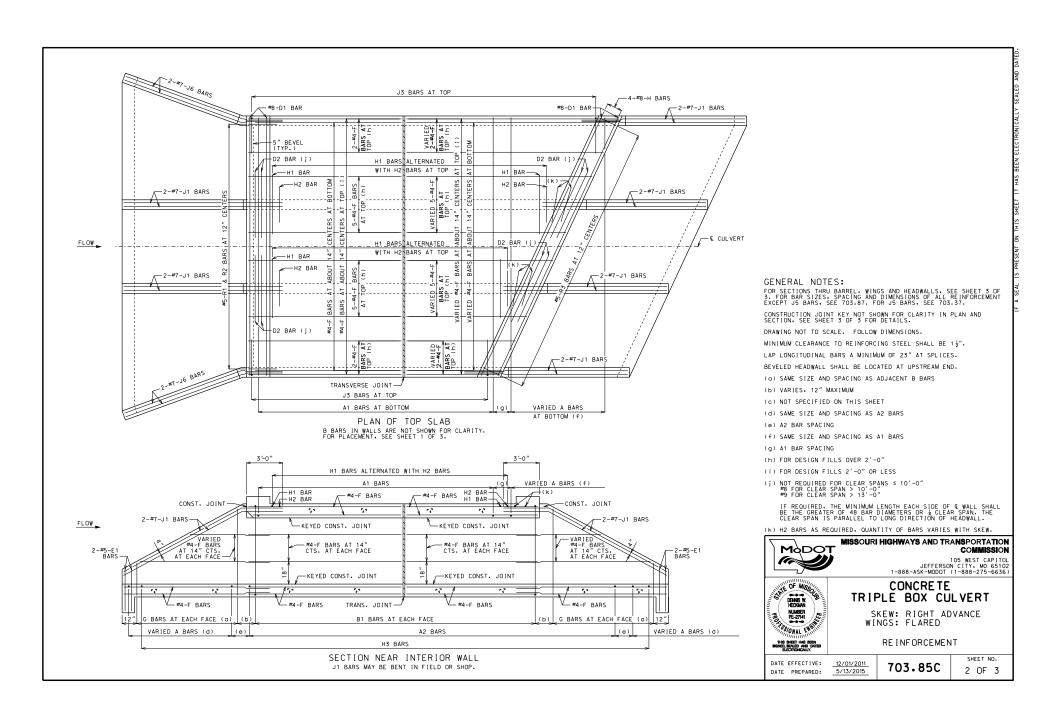
SECTIONS

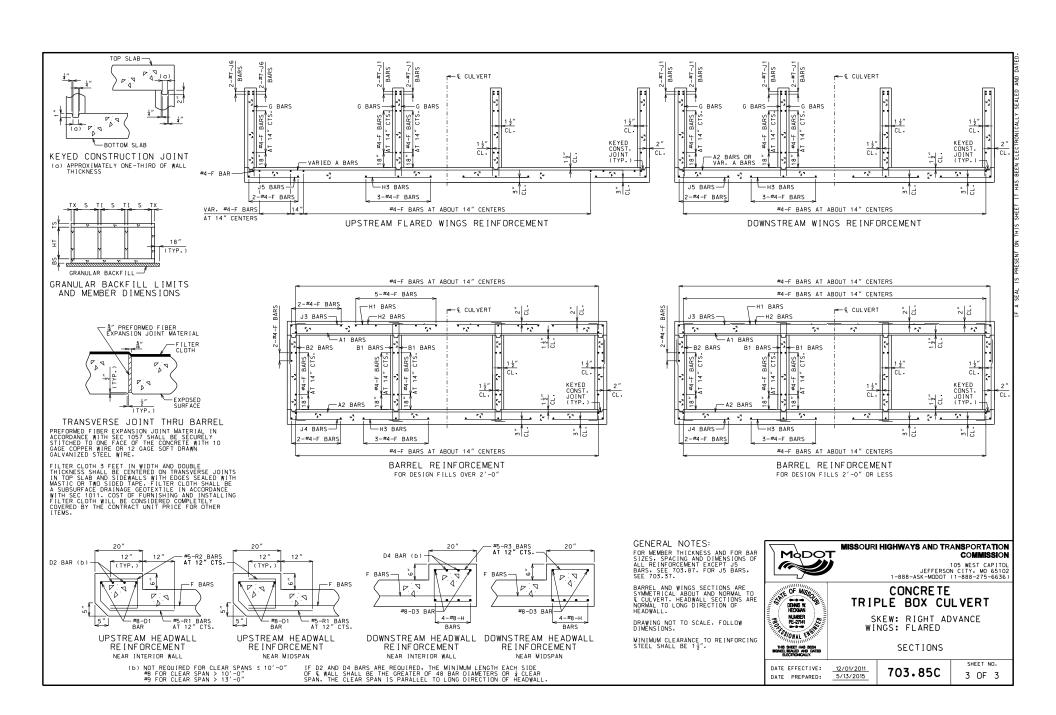
DATE EFFECTIVE: DATE PREPARED: 12/01/2011 5/13/2015 703.84H

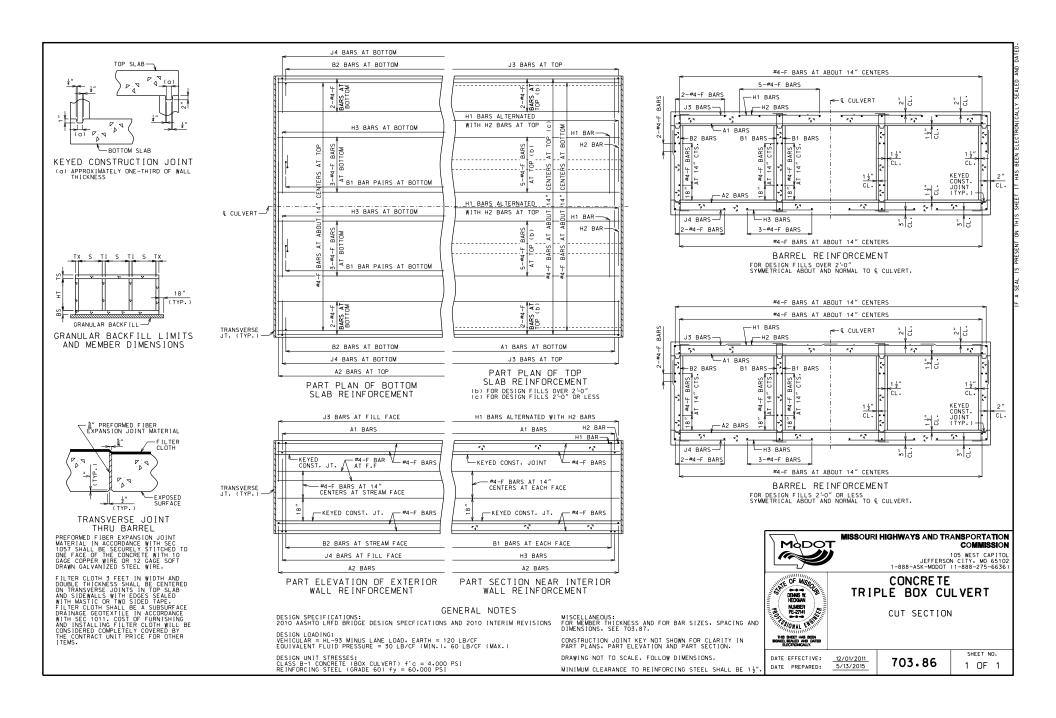
SHEET NO.

(b) NOT REQUIRED FOR CLEAR SPANS ≤ 10'-0" #8 FOR CLEAR SPAN > 10'-0" #9 FOR CLEAR SPAN > 13'-0" IF D2 BARS ARE REQUIRED, THE MINIMUM LENGTH EACH SIDE OF & WALL SHALL BE THE GREATER OF 48 BAR DIAMETERS OR \$\frac{1}{2}CLEAR SPAN. THE CLEAR SPAN IS PARALLEL TO LONG DIRECTION OF HEADWALL.

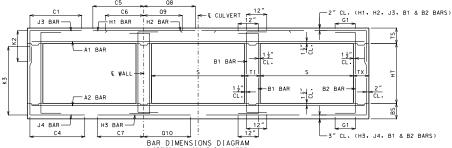








												SPA	N (S) = 3	FT			HEIG	HT (F	IT)	= 5	FT (DR 6	FT										
		MEM										TOP S	SLAB I	BARS										E	воттом	SLAB E	BARS					WAL	L BA	RS
DESIGN	1	THICE	(NES	S	A1	BARS			J3	BARS			H1	BARS			H2	BARS		A2	BARS			J4	BARS			Н3	BARS		B1	BARS	B2	2 BARS
FILL	TS	вѕ	тх	ΤI	SIZE	SPA.	SIZE	SPA.	C1	HT=5'	2 HT=6'	SIZE	SPA.	C5	08	SIZE	SPA.	C6	09	SIZE	SPA.	SIZE	SPA.	C4	HT=5'	3 HT=6'	SIZE	SPA.	C 7	010	SIZE	SPA.	SIZE	SPA. G
1 FT	10	8	8	8	4	8.5	4	10.5	26.8	26.0	26.0	4	24	39.5	30.5	4	24	21.0	20.0	4	12	4	11.5	36.0	64	76	4	12	34.0	25.0	5	12	5	12 12
2 FT	10	8	8	8	4	8.5	4	10.5	26.8	26.0	26.0	4	24	39.5	30.5	4	24	20.0	20.0	4	12	4	11	36.0	64	76	4	12	34.0	24.0	5	12	5	12 12
4 FT	8	8	8	8	4	12	4	12	26.8	24.0	24.0	4	24	39.5	34.0	4	24	19.0	19.0	4	12	4	10	36.0	64	76	4	12	34.0	24.0	5	12	5	12 12
6 FT	8	8	8	8	4	12	4	12	26.8	24.0	24.0	4	24	39.5	26.0	4	24	18.0	19.0	4	12	4	9.5	36.0	64	76	4	12	34.0	23.0	5	12	5	12 12
8 FT	8	8	8	8	4	12	4	12	26.8	24.0	24.0	4	24	39.5	24.0	4	24	18.0	18.0	4	12	4	9	36.0	64	76	4	12	24.0	23.0	5	12	5	12 0
10 FT	8	8	8	8	4	12	4	12	26.8	24.0	24.0	4	24	39.5	23.0	4	24	18.0	18.0	4	12	4	8.5	36.0	64	76	4	12	23.0	23.0	5	12	5	12 0
12 FT	8	8	8	8	4	12	4	12	34.9	24.0	24.0	4	24	22.0	22.0	4	24	17.0	18.0	4	12	4	9	34.4	64	76	4	12	22.0	23.0	5	12	5	12 0
14 FT	8	8	8	8	4	12	4	11	34.5	24.0	24.0	4	24	22.0	22.0	4	24	17.0	18.0	4	12	4	8.5	34.1	64	76	4	12	22.0	23.0	5	12	5	12 0
16 FT	8	8	8	8	4	12	4	10	34.3	24.0	24.0	4	24	22.0	22.0	4	24	17.0	18.0	4	12	4	8	33.9	64	76	4	12	22.0	23.0	5	12	5	12 0
18 FT	8	8	8	8	4	12	4	9	34.0	24.0	24.0	4	24	22.0	22.0	4	24	17.0	18.0	4	12	4	7.5	33.8	64	76	4	12	22.0	23.0	5	12	5	12 0
20 FT	8	8	8	8	4	12	4	8	33.8	24.0	24.0	4	24	22.0	22.0	4	24	17.0	18.0	4	12	4	7	33.6	64	76	4	11.5	22.0	23.0	5	12	5	12 0
22 FT	8	8	8	8	4	12	4	7.5	33.6	24.0	24.0	4	24	22.0	22.0	4	24	17.0	18.0	4	12	4	6.5	33.5	64	76	4	10.5	22.0	23.0	5	12	5	12 0
24 FT	8	8	8	8	4	12	4	7	33.5	24.0	24.0	4	24	22.0	22.0	4	24	17.0	18.0		11.5	4	6	33.4	64	76	4	10.5	22.0	23.0	5	12	5	12 0
26 FT	8	8	8	8	4	12	4	6.5	33.4	24.0	24.0	4	24	21.0	22.0	4	24	17.0	18.0	4	10.5	5	6.5	33.3	64	76	4	10	22.0	22.0	5	12	5	12 0
28 FT	8	8	8	8	4	12	4	6	33.3	24.0	24.0	4	24	21.0	22.0	4	24	17.0	18.0	4	10	5	6	33.1	64	76	4	9.5	22.0	22.0	5	12	5	12 0
30 FT	8	8	9	8	4	11.5	4	6.5	32.3	24.0	24.0	4	24	21.0	22.0	4	24	17.0	18.0	4	9.5	4	6	32.1	64	76	4	9	22.0	23.0	5	12	5	12 0
32 FT	8	9	9	8	4	11	4	6.5	32.1	24.0	24.0	4	24	21.0	22.0	4	24	17.0	18.0	4	10	4	6.5	34.1	65	77	4	10.5	22.0	23.0	5	12	5	12 0
34 FT	8	9	9	8	4	10	4	6	32.0	24.0	24.0	4	23	21.0	22.0	4	23	17.0	18.0	4	9.5	4	6	34.0	65	77	4	10	22.0	23.0	5	12	5	11.5 0
36 FT	8	9	9	8	4	9.5	5	7	32.0	24.0	24.0	4	22	21.0	22.0	4	22	17.0	18.0	4	9	4	6	34.0	65	77	4	10	22.0	23.0	5	12	5	11 0
38 FT	8	9	9	8	4	9	5	6.5	32.0	24.0	28.0	4	21	21.0	22.0	4	21	17.0	18.0	4	8.5	5	7	34.0	65	77	4	9.5	22.0	23.0	5	12	5	10 0
40 FT	8	10	9	8	4	8.5	5	6	31.9	24.0	24.0	4	20	21.0	22.0	4	20	17.0	18.0	4	9	4	6	35.5	66	78	4	10.5	23.0	23.0	5	12	5	10 0
42 FT	9	10	9	8	4	9.5	5	6.5	33.4	25.0	29.0	4	22	21.0	22.0	4	22	17.0	18.0	4	9	5	7	35.3	66	78	4	10	23.0	23.0	5	12	5	9.5 0
44 FT	9	10	9	8	4	9	5	6.5	33.3	25.0	29.0	4	21	21.0	22.0	4	21	17.0	18.0	4	8.5	5	6.5	35.3	66	78	4	10	23.0	23.0	5	12	5	9 0
46 FT	9	10	9	8	4	8.5	5	6	33.3	25.0	29.0	4	21	21.0	22.0	4	21	17.0	18.0	4	8	5	6.5	35.1	66	78	4	9.5	23.0	23.0	5	12		8.5 0
48 FT	9	11	9	8	4	8	5	6	33.1	25.0	29.0	4	20	21.0	22.0	4	20	17.0	18.0	4	8.5	5	6.5	36.4	67	79	4	10	23.0	23.0	5	12		8.5 0
50 FT	9	11	9	8	4	7.5	5 C5	6	33.1	25.0	29.0	4	19	21.0	22.0	4	19	17.0	18.0	4	8.5	5	6.5	36.4	67	79	4	10	23.0	23.0	5	12	5	8.5 0



THEORES (ON FILLS). ETWEEN TABLEATED DESIGN FILLS, USE THE NETT PROBLEM FOR THE PROPERTY OF TH

SPECIAL DESIGNS ARE REQUIRED WHEN THE DESIGN FILL IS LESS THAN 1 FOOT OR GREATER THAN 50 FEET.

DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.

DESIGN FILLS ARE MEASURED FROM THE TOP OF TOP SLAB TO THE TOP OF EARTH FILL OR ROADWAY.

CULVERTS MEET STRENGTH AND SERVICEABILITY REQUIREMENTS FOR THE DESIGN VEHICULAR LIVE LOAD HL-93 MINUS THE LANE LOAD.



MISSOURI HIGHWAYS AND TRANSPORTATION

COMMISSION 105 WEST CAPITOL

JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)



CONCRETE TRIPLE BOX CULVERT

MEMBER THICKNESS BAR SIZE. SPACING & DIMENSIONS

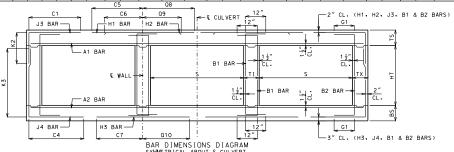
SPAN (S): 3 FEET HEIGHT (HT): 2 THRU 6 FEET

DATE EFFECTIVE: DATE PREPARED: 9/29/2011

703.87

SHEET NO. 1 OF 27

												SPA	AN (S	5) = 4	1 FT			HEIG	HT (F	HT)	= 4	FT (OR 5	FT											
		MEMI										TOP	SLAB												BOTTOM	SLAB E	BARS					₩AL			
DESIGN	T	THICK	NESS		A1	BARS			J:	BARS			H1	BARS			H2	BARS		A2	BARS			J4	BARS			Н3	BARS		B1	BARS	B2	2 BARS	
FILL	TS	BS	тх	ΤI	SIZE	SPA.	SIZE	SPA.	C1		2 HT=5'	SIZE	SPA.	C5	08	SIZE	SPA.	C6	09	SIZE	SPA.	SIZE	SPA.	C4	HT=4′	3 HT=5'	SIZE	SPA.	C7	010	SIZE	SPA.	SIZE	SPA.	G1
1 FT	10	8	8	8	4	7	4	10.5	30.3	26.0	26.0	4	24	47.5	36.5	4	24	21.0	21.0	4	12	4	12	42.0	52	64	4	12	28.0	28.0	5	12	5	12 1	12
2 FT	10	8	8	8	4	7	4	10.5	30.3	26.0	26.0	4	24	47.5	36.5	4	24	21.0	21.0	4	12	4	12	39.1	52	64	4	11	27.0	28.0	5	12	5		12
4 FT	8	8	8	8	4	12	4	12	30.3	24.0	24.0	4	24	47.5	37.0	4	24	20.0	20.0	4	12	4	12	34.8	52	64	4	11	26.0	27.0	5	12	5	12 1	12
6 FT	8	8	8	8	4	12	4	12	34.6	24.0	24.0	4	24	29.0	30.0	4	24	19.0	19.0	4	12	4	11.5	32.1	52	64	4	10.5	25.0	26.0	5	12	5	12 1	12
8 FT	8	8	8	8	4	12	4	12	31.4	24.0	24.0	4	24	27.0	28.0	4	24	19.0	19.0	4	12	4	11	30.3	52	64	4	9.5	25.0	26.0	5	12	5	12	0
10 FT	8	8	8	8	4	12	4	12	29.9	24.0	24.0	4	24	26.0	27.0	4	24	19.0	19.0	4	12	4	10.5	29.3	52	64	4	9	25.0	26.0	5	12	5	12	0
12 FT	8	8	8	8	4	12	4	12	29.1	24.0	24.0	4	24	25.0	27.0	4	24	18.0	19.0	4	11.5	4	10	28.5	52	64	4	8.5	24.0	26.0	5	12	5	12	0
14 FT	8	8	8	8	4	12	4	11	28.5	24.0	24.0	4	23	25.0	26.0	4	23	18.0	19.0	4	10.5	4	9.5	28.1	52	64	4	7.5	24.0	26.0	5	12	5	12	0
16 FT	8	8	8	8	4	12	4	11	26.9	24.0	24.0	4	22	24.0	26.0	4	22	18.0	19.0	4	10	4	9.5	26.6	52	64	4	7.5	24.0	26.0	5	12	5	12	0
18 FT	80	8	8	8	4	11	4	10	26.8	24.0	24.0	4	21	24.0	26.0	4	21	18.0	19.0	4	9	4	8.5	26.5	52	64	4	7	24.0	26.0	5	12	5	12	0
20 FT	8	8	8	8	4	10	4	9	26.8	24.0	24.0	4	19	24.0	26.0	4	19	18.0	19.0	4	8	4	8	26.4	52	64	4	6.5	24.0	26.0	5	12	5	12	0
22 FT	8	8	8	8	4	9	4	8	26.6	24.0	24.0	4	17	24.0	26.0	4	17	18.0	18.0	4	7	4	7	26.4	52	64	4	6	24.0	26.0	5	12	5		0
24 FT	8	9	8	8	4	8.5	4	7.5	26.6	24.0	24.0	4	16	24.0	25.0	4	16	18.0	18.0	4	7.5	4	8.5	26.6	53	65	4	7	24.0	26.0	5	12	5	12	0
26 FT	8	9	8	8	4	8	4	7	26.6	24.0	24.0	4	14	24.0	25.0	4	14	18.0	18.0	4	7	4	8	26.5	53	65	4	6.5	24.0	26.0	5	12	5	12	0
28 FT	8	10	8	8	4	7.5	4	6	26.6	24.0	24.0	4	13	24.0	25.0	4	13	18.0	18.0	4	7.5	4	9.5	26.8	54	66	4	7.5	24.0	26.0	5	12	5		0
30 FT	9	10	8	8	4	7.5	4	7.5	26.9	25.0	25.0	4	15	24.0	26.0	4	15	18.0	19.0	4	7	4	9	26.9	54	66	4	7	24.0	26.0	5	12	5		0
32 FT	9	10	8	8	4	7	4	7	26.9	25.0	25.0	4	14	24.0	26.0	4	14	18.0	19.0	4	6	4	8	26.8	54	66	4	6	24.0	26.0	5	12	5		0
34 FT	9	11	8	8	4	6.5	4	6.5	26.9	25.0	25.0	4	13	24.0	26.0	4	13	18.0	18.0	4	6.5	4	8.5	27.0	55	67	4	7	24.0	26.0	5	12	5		0
36 FT	10	11	8	8	4	7	4	6.5	27.1	26.0	26.0	4	14	23.0	26.0	4	14	18.0	19.0	4	6.5	4	8	27.1	55	67	4	7	24.0	26.0	5	12	5		0
38 FT	10	12	8	8	4	6.5	4	6	27.3	26.0	26.0	4	14	23.0	26.0	4	14	18.0	19.0	4	6.5	4	8	27.4	56	68	4	7.5	24.0	26.0	5	12	5		0
40 FT	10	12	8	8	4	6	5	8	27.1	26.0	26.0	4	13	23.0	26.0	4	13	18.0	19.0	4	6.5	4	7.5	27.4	56	68	4	7	24.0	26.0	5	12	5		0
42 FT	11	12	8	8	4	6.5	5	9	27.4	27.0	27.0	4	14	23.0	26.0	4	14	18.0	19.0	4	6	4	7	27.4	56	68	4	6.5	24.0	26.0	5	12	5		0
44 FT	11	12	8	8	4	6	5	8.5	27.4	27.0	27.0	4	13	23.0	26.0	4	13	18.0	19.0	4	6	4	6.5	27.4	56	68	4	6.5	24.0	26.0	5	12	5		0
46 FT	11	13	8	8	4	6	5	8.5	27.5	27.0	27.0	4	13	23.0	26.0	4	13	18.0	19.0	4	6	4	7	27.6	57	69	4	6.5	24.0	26.0	5	12	5		0
48 FT	12	13	8	8	4	6	5	8.5	27.6	28.0	28.0	4	14	23.0	25.0	4	14	18.0	18.0	4	6	4	6.5	27.8	57	69	4	6.5	24.0	26.0	5	12	5		
50 FT	12	13	8	8	4	6	5	8.5	27.6	28.0	28.0	4	13	23.0	25.0	4	13	18.0	18.0	5	9	4	6	27.8	57	69	4	6	24.0	26.0	5	12	5	11	0
							CF			O8																									



SPECIAL DESIGNS ARE REQUIRED WHEN THE DESIGN FILL IS LESS THAN 1 FOOT OR GREATER THAN 50 FEET.

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DESIGN FILLS ARE MEASURED FROM THE TOP OF TOP SLAB TO THE TOP OF EARTH FILL OR ROADWAY.

CULVERTS MEET STRENGTH AND SERVICEABILITY REQUIREMENTS FOR THE DESIGN VEHICULAR LIVE LOAD HL-93 MINUS THE LANE LOAD.



MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

COMMISSION 105 WEST CAPITOL

JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)



CONCRETE TRIPLE BOX CULVERT

MEMBER THICKNESS
BAR SIZE, SPACING & DIMENSIONS

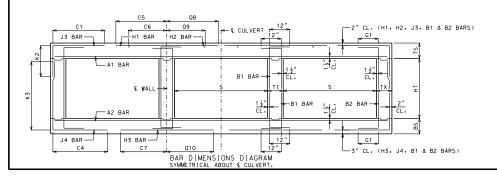
SPAN (S): 4 FEET HEIGHT (HT): 2 THRU 5 FEET

DATE EFFECTIVE: DATE PREPARED: 9/29/2011

703.87

SHEET NO. 2 OF 27 IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN E

												SPA		5) = 4	1 FT			HEIG	HT (F	IT)	= 6	FT (OR 7	FΤ										
		MEM										TOP	SLAB												воттом	SLAB I	BARS					WAL		
DESIGN		THICH	KNES	S	A1	BARS			J.	BARS			H1	BARS			H2	BARS		A2	BARS			J4	BARS			Н3	BARS		B1 I	BARS	B2	BARS
FILL	TS	BS	ТX	ΤI	SIZE	SPA.	SIZE	SPA.	C1	HT=6'	2 HT=7'	SIZE	SPA.	C5	08	SIZE	SPA.	C6	09	SIZE	SPA.	SIZE	SPA.	C4	HT=6′	3 HT=7'	SIZE	SPA.	C7	010	SIZE	SPA.	SIZE	SPA. G1
1 FT	10	8	8	8	4	6.5	4	10.5	30.3	26.0	26.0	4	24	47.5	36.5	4	24	22.0	21.0	4	12	4	9	42.0	76	88	4	11.5	40.0	28.0	5	12	5	12 12
2 FT	10	8	8	8	4	6.5	4	10.5	30.3	26.0	26.0	4	24	47.5	36.5	4	24	21.0	21.0	4	12	4	8.5	42.0	76	88	4	11	40.0	28.0	5	12	5	12 12
4 FT	8	8	8	8	4	12	4	10	30.3	24.0	24.0	4	24	47.5	37.0	4	24	20.0	20.0	4	12	4	7.5	42.0	76	88	4	11	29.0	27.0	5	12	5	12 12
6 FT	8	8	8	8	4	12	4	10	30.3		24.0	4	24	47.5	29.0	4	24	19.0	19.0	4	12	4	7	42.0	76	88	4	10	27.0	26.0	5	12	5	12 12
8 FT	8	8	8	8	4	12	4	9	30.3		24.0	4	24	47.5	28.0	4	24	19.0	19.0	4	12	4	6.5	42.0	76	88	4	9.5	26.0	26.0	5	12	5	12 0
10 FT	8	8	8	8	4	12	4	8	43.1	24.0	24.0	4	24	28.0	27.0	4	24	18.0	19.0	4	12	4	6.5	40.6	76	88	4	9	25.0	26.0	5	12	5	12 0
12 FT	8	8	8	8	4	12	4	7.5	40.5	24.0	24.0	4	24	27.0	26.0	4	24	18.0	19.0	4	11.5	4	6	39.1	76	88	4	8.5	25.0	26.0	5	12	5	12 0
14 FT	8	8	8	8	4	12	4	6.5	39.3		24.0	4	23	26.0	26.0	4	23	18.0	19.0	4	10.5	5	6.5	38.4	76	88	4	8	25.0	26.0	5	12	5	12 0
16 FT	8	8	8	8	4	12	4	6.5	35.5		24.0	4	23	24.0	25.0	4	23	18.0	19.0	4	10	5	6.5	35.4	76	88	4	7.5	24.0	26.0	5	12	5	12 0
18 FT	8	8	8	8	4	11.5	4	6	35.3		24.0	4	21	24.0	25.0	4	21	18.0	18.0	4	9	5	6	35 - 1	76	88	4	7	24.0	26.0	5	12	5	12 0
20 FT	8	8	8	8	4	10	5	6.5	35.0	24.0	28.0	4	19	24.0	25.0	4	19	18.0	18.0	4	8	6	6.5	38.0	76	88	4	6.5	24.0	26.0	5	12	5	12 0
22 FT	8	9	8	8	4	9.5	5	6	34.6		28.0	4	18	24.0	25.0	4	18	18.0	18.0	4	8.5	5	6	36.1	77	89	4	8	25.0	26.0	5	12	5	11.5 0
24 FT	8	9	9	8	4	8.5	5	6.5	34.1	24.0	28.0	4	16	24.0	25.0	4	16	18.0	18.0	4	8	5	7	35.6	77	89	4	7.5	25.0	26.0	5	12		11.5 0
26 FT	8	9	9	8	4	8	5	6	34.0	24.0	28.0	4	15	24.0	25.0	4	15	18.0	18.0	4	7.5	5	6.5	35.5	77	89	4	7	25.0	26.0	5	12	5	11 0
28 FT	8	10	9	8	4	7.5	6	7.5	36.8	24.0	28.0	4	14	24.0	25.0	4	14	18.0	18.0	4	7.5	5	7	36.6	78	90	4	7.5	25.0	26.0	5	12	5	10.5 0
30 FT	9	10	9	8	4	8	5	6	35.0	25.0	29.0	4	15	24.0	25.0	4	15	18.0	18.0	4	7	5	6.5	36.4	78	90	4	7	25.0	26.0	5	12	5	10 0
32 FT	9	10	9	8	4	7.5	5	6	35.0	25.0	29.0	4	14	24.0	25.0	4	14	18.0	18.0	4	6.5	5	6	36.3	78	90	4	6.5	25.0	26.0	5	12		9.5 0
34 FT	9	11	9	8	4	7	5	6	34.9	25.0	29.0	4	13	24.0	25.0	4	13	18.0	18.0	4	7	5	6.5	37.4	79	91	4	7	25.0	26.0	5	12	5	9 0
36 FT	10	11	9	8	4	7	5	6.5	35.9	26.0	30.0	4	15	24.0	25.0	4	15	18.0	18.0	4	7	5	6	37.0	79	91	4	7	25.0	26.0	5	12		8.5 0
38 FT	10	11	9	8	4	7	5	6	35.8	26.0	30.0	4	14	24.0	25.0	4	14	18.0	18.0	4	6.5	6	7.5	40.0	79	91	4	6.5	25.0	26.0	5	12	5	8.5 0
40 FT	10	12	9	8	4	6.5	5	6	35.6	26.0	30.0	4	13	24.0	25.0	4	13	18.0	18.0	4	6.5	5	6	38.3	80	92	4	7	25.0	26.0	5	12		8.5 0
42 FT	10	12	9	8	4	6	5	6	35.6	30.0	30.0	4	12	24.0	25.0	4	12	18.0	18.0	4	6.5	6	7.5	41.1	80	92	4	6.5	25.0	26.0	5	12		8.5 0
44 FT	11	12	9	8	4	6.5	6	7.5	39.5	31.0	35.0	4	14	24.0	25.0	4	14	18.0	18.0	4	6	6	7	40.9	80	92	4	6.5	25.0	26.0	5	12		8.5 0
46 FT	11	13	9	8	4	6	6	6.5	39.4	31.0	35.0	4	13	24.0	25.0	4	13	18.0	18.0	4	6.5	6	7.5	42.0	81	93	4	6.5	26.0	26.0	5	12	5	8.5 0
48 FT	11	13	10	8	4	6	5	6	36.3		31.0	4	13	23.0	25.0	4	13	18.0	18.0	4	6	5	6.5	38.4	81	93	4	6.5	25.0	26.0	5	12	5	8 0
50 FT	12	13	11	8	4	6	5	7	37.0	28.0	32.0	4	14	23.0	25.0	4	14	18.0	18.0	4	6	5	7.5	37.9	81	93	4	6	25.0	26.0	5	12	5	7.5 0



IF DESIGN FILL IS BETWEEN TABULATED DESIGN FILLS. USE THE NEXT GREATER TABULATED DESIGN FILL, EXCEPT FOR DESIGN FILLS BETWEEN 2 FEET AND 4 FEET. FOR DESIGN FILLS BETWEEN 2 FEET AND 4 FEET SET THE GREATER MEMBER THICKNESS. AREA OF REINFORCEMENT AND BAR DIMENSIONS FROM THE 2 FEET AND 4 FEET TABULATED DESIGN FILLS. AREA OF REINFORCEMENT EDUALS BAR AREA PER FOOT SPACING.

SPECIAL DESIGNS ARE REQUIRED WHEN THE DESIGN FILL IS LESS THAN 1 FOOT OR GREATER THAN 50 FEET.

DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.

DESIGN FILLS ARE MEASURED FROM THE TOP OF TOP SLAB TO THE TOP OF EARTH FILL OR ROADWAY.

CULVERTS MEET STRENGTH AND SERVICEABILITY REQUIREMENTS FOR THE DESIGN VEHICULAR LIVE LOAD HL-93 MINUS THE LANE LOAD.



MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)



CONCRETE TRIPLE BOX CULVERT

MEMBER THICKNESS BAR SIZE, SPACING & DIMENSIONS

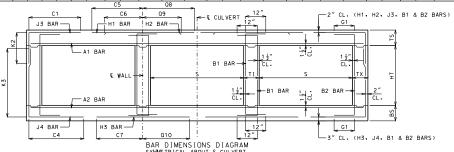
SPAN (S): 4 FEET HEIGHT (HT): 6 THRU 7 FEET

DATE EFFECTIVE: DATE PREPARED: 9/29/2011

703.87

SHEET NO. 3 OF 27

												SPA	7N (S	5) = 5	FT			HEIC	HT (F	IT)	= 5	FT (OR 6	FT											
		MEM										TOP	SLAB												BOTTOM	SLAB E	BARS					WAL			
DESIGN		HICK	NESS		Α1	BARS			J:	3 BARS			H1	BARS			H2	BARS		A2	BARS			J4	BARS			Н3	BARS		B1	BARS	B?	2 BARS	
FILL	TS	вѕ	тх	ΤI	SIZE	SPA.	SIZE	SPA.	C1		2 HT=6'	SIZE	SPA.	C5	08	SIZE	SPA.	C6	09	SIZE	SPA.	SIZE	SPA.	C4	HT=5′	3 HT=6'	SIZE	SPA.	C7	010	SIZE	SPA.	SIZE	SPA. C	G1
1 FT	11	8	8	8	4	6	4	9.5	33.9	27.0	27.0	4	22	56.5	42.5	4	22	23.0	23.0	4	12	4	10	47.5	64	76	4	8.5	31.0	31.0	5	12	5	12 1	12
2 FT	11	8	8	8	4	6	4	9.5	33.9	27.0	27.0	4	21	56.5	42.5	4	21	22.0	22.0	4	11	4	9.5	42.8	64	76	4	8	30.0	31.0	5	12	5		12
4 FT	8	8	8	8	4	10	4	10	33.9	24.0	24.0	4	20	56.5	46.0	4	20	21.0	21.0	4	12	4	9	38.9	64	76	4	8.5	29.0	30.0	5	12	5	12 1	12
6 FT	8	8	8	8	4	12	4	10.5	38.3	24.0	24.0	4	21	33.0	35.0	4	21	20.0	20.0	4	12	4	8.5	35.5	64	76	4	7.5	28.0	30.0	5	12	5	12 1	12
8 FT	8	8	8	8	4	12	4	10	34.4	24.0	24.0	4	20	30.0	31.0	4	20	19.0	20.0	4	10.5	4	8	33.5	64	76	4	7	28.0	29.0	5	12	5	12	0
10 FT	8	8	8	8	4	10.5	4	9	32.9	24.0	24.0	4	18	29.0	30.0	4	18	19.0	19.0	4	9	4	7.5	32.3	64	76	4	6.5	27.0	29.0	5	12	5	12	0
12 FT	8	8	8	8	4	9.5	4	8	31.9	24.0	24.0	4	16	28.0	30.0	4	16	19.0	19.0	4	7.5	4	7	31.3	64	76	4	6	27.0	29.0	5	12	5	12	0
14 FT	8	8	8	8	4	8.5	4	7	31.1	24.0	24.0	4	14	28.0	29.0	4	14	19.0	19.0	4	7	4	6	30.8	64	76	5	7	27.0	29.0	5	12	5	12	0
16 FT	8	9	8	8	4	8	4	6.5	30.8	24.0	24.0	4	13	28.0	29.0	4	13	19.0	19.0	4	7	4	7	30.9	65	77	4	6	27.0	29.0	5	12	5	12	0
18 FT	8	9	8	8	4	7.5	4	6.5	29.1	24.0	24.0	4	12	27.0	28.0	4	12	19.0	19.0	4	6.5	4	7	29.1	65	77	4	6	27.0	29.0	5	12	5	12	0
20 FT	8	9	8	8	4	7	5	7	29.0	24.0	24.0	5	17	27.0	28.0	5	17	19.0	19.0	4	6	4	6.5	29.0	65	77	5	7.5	27.0	29.0	5	12	5	12	0
22 FT	9	10	8	8	4	7	4	6.5	29.1	25.0	25.0	4	12	26.0	29.0	4	12	19.0	19.0	4	6	4	7.5	29.3	66	78	4	6	27.0	29.0	5	12	5		0
24 FT	9	10	8	8	4	6.5	4	6	29.1	25.0	25.0	5	17	26.0	29.0	5	17	19.0	19.0	5	8.5	4	7	29.1	66	78	5	7.5	27.0	29.0	5	12	5	12	0
26 FT	10	11	8	8	4	6.5	5	8	29.4	26.0	26.0	4	12	26.0	29.0	4	12	19.0	19.0	4	6	4	6.5	29.4	67	79	5	8.5	26.0	29.0	5	12	5	12	0
28 FT	10	11	8	8	4	6	5	7.5	29.3	26.0	26.0	5	17	26.0	29.0	5	17	19.0	19.0	5	8.5	4	6	29.4	67	79	5	8	26.0	29.0	5	12	5		0
30 FT	10	12	8	8	5	8.5	5	7.5	29.3	26.0	26.0	5	16	26.0	29.0	5	16	19.0	19.0	5	9	4	6	29.5	68	80	5	8.5	26.0	30.0	5	12	5		0
32 FT	11	12	8	8	5	9	5	8	29.5	27.0	31.0	5	17	26.0	29.0	5	17	19.0	19.0	5	8.5	5	8	29.6	68	80	5	8	26.0	30.0	5	12	5		0
34 FT	11	13	8	8	5	8.5	5	7.5	29.5	27.0	31.0	5	16	26.0	29.0	5	16	19.0	19.0	5	8.5	5	8.5	29.8	69	81	5	8.5	26.0	30.0	5	12	5		0
36 FT	12	13	8	8	5	8.5	5	8	29.8	28.0	32.0	5	17	26.0	29.0	5	17	18.0	19.0	5	8	5	8	29.9	69	81	5	8	26.0	30.0	5	12	5		0
38 FT	12	14	8	8	5	8	5	7.5	29.8	28.0	32.0	5	16	26.0	29.0	5	16	18.0	19.0	5	8.5	5	8.5	30.1	70	82	5	8.5	26.0	30.0	5	12	5		0
40 FT	12	14	8	8	5	7.5	5	7	29.8	28.0	32.0	5	15	26.0	29.0	5	15	18.0	19.0	5	8	5	8	30.0	70	82	5	8	26.0	30.0	5	12	5		0
42 FT	13	14	8	8	5	8	5	7.5	29.9	29.0	33.0	5	16	26.0	29.0	5	16	18.0	19.0	5	7.5	5	7.5	30.1	70	82	5	7.5	26.0	30.0	5	12	5		0
44 FT	13	15	8	8	5	7.5	5	7	30.0	29.0	33.0	5	15	26.0	29.0	5	15	18.0	19.0	5	8	5	8	30.4	71	83	5	8	27.0	30.0	5	12	5		0
46 FT	14	15	8	8	5	7.5	5	6.5	30.1	30.0	34.0	5	16	26.0	28.0	5	16	18.0	19.0	5	7.5	5	7.5	30.5	71	83	5	7.5	27.0	30.0	5	12	5		0
48 FT	14	15	9	8	5	7.5	5	8	30.6	30.0	34.0	5	16	26.0	28.0	5	16	18.0	19.0	5	7.5	5	8	30.8	71	83	5	7.5	27.0	30.0	5	12	5		0
50 FT	14	16	9	8	5	7	5	7.5	30.8	30.0	34.0	5	15	26.0	28.0	5	15	18.0	19.0	5	7.5	5	8	31.0	72	84	5	7.5	27.0	30.0	5	12	5	8.5	0
							C	. —		OΒ																									



OFFICIARY NOTICES.

BETWEEN TABLEATED DESIGN FILLS. USE THE NEST PROFITS OF THE NEST P

SPECIAL DESIGNS ARE REQUIRED WHEN THE DESIGN FILL IS LESS THAN 1 FOOT OR GREATER THAN 50 FEET.

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MISSOURI HIGHWAYS AND TRANSPORTATION

COMMISSION 105 WEST CAPITOL

JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)



CONCRETE TRIPLE BOX CULVERT

MEMBER THICKNESS
BAR SIZE, SPACING & DIMENSIONS

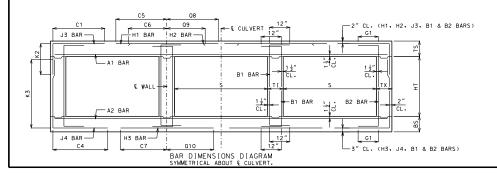
SPAN (S): 5 FEET HEIGHT (HT): 3 THRU 6 FEET

DATE EFFECTIVE: DATE PREPARED: 9/29/2011

703.87

.87 4 OF 27

												SPA		.) = 5	FT			HEIG	HT (F	(T)	= 7	FT (OR 8	FT											Ī
		MEM										TOP :	SLAB	BARS										Е	воттом	SLAB B	BARS					₩AL	L BA		
DESIGN		THIC	(NES	5	A1	BARS			J3	BARS			H1	BARS			H2	BARS		A2	BARS			J4	BARS			Н3	BARS		B1	BARS	B2	2 BARS	
FILL	TS	вѕ	ТX	ΤI	SIZE	SPA.	SIZE	SPA.	C1		2 HT=8'	SIZE	SPA.	C5	08	SIZE	SPA.	C6	09	SIZE	SPA.	SIZE	SPA.	C4		3 HT=8'	SIZE	SPA.	C7	010	SIZE	SPA.	SIZE	SPA. G	31
1 FT	11	8	8	8	4	6	4	9	33.9	27.0	27.0	4	22	56.5	42.5	4	22	23.0	23.0	4	11	4	7	48.0	88	100	4	8	46.0	31.0	5	12	5	12 1	2
2 FT	11	8	8	8	4	6	4	8.5	33.9	27.0	27.0	4	21	56.5	42.5	4	21	23.0	23.0	4	10.5	4	6.5	48.0	88	100	4	8	32.0	31.0	5	12	5	12 1	2
4 FT	8	8	8	8	4	9.5	4	7	33.9	24.0	24.0	4	20	56.5	46.0	4	20	21.0	21.0	4	11.5	4	6	48.0	88	100	4	8	31.0	30.0	5	12	5	12 1	2
6 FT	8	8	8	8	4	12	4	7	33.9	24.0	24.0	4	21	56.5	35.0	4	21	20.0	20.0	4	11	5	6	48.0	88	100	4	7.5	29.0	30.0	5	12	5	12 1	2
8 FT	8	8	8	8	4	12	4	6.5	51.8	24.0	24.0	4	20	34.0	31.0	4	20	19.0	20.0	4	10	5	6	46.0	88	100	4	7	28.0	29.0	5	12	5	12 0	О
10 FT	8	8	9	8	4	11	4	7	43.8	24.0	24.0	4	18	30.0	30.0	4	18	19.0	20.0	4	9	4	6	41.6	88	100	4	6.5	28.0	29.0	5	12	5	12 (О
12 FT	8	8	9	8	4	9.5	4	6	41.3	24.0	24.0	4	16	29.0	30.0	4	16	19.0	19.0	4	8	5	6	40.4	88	100	4	6	27.0	29.0	5	12	5	12 (О
14 FT	8	9	9	8	4	9	5	7	39.9	24.0	28.0	4	15	28.0	29.0	4	15	19.0	19.0	4	8	5	6.5	41.4	89	101	4	6.5	27.0	29.0	5	12	5	11.5	О
16 FT	8	9	9	8	4	8	5	6	39.1	24.0	28.0	4	13	28.0	29.0	4	13	19.0	19.0	4	7	5	6	40.8	89	101	4	6	27.0	29.0	5	12	5	11 (5
18 FT	8	9	9	8	4	7.5	5	6	36.5	24.0	28.0	4	13	26.0	28.0	4	13	19.0	19.0	4	7	5	6	38.1	89	101	4	6	27.0	29.0	5	12	5	11.5	
20 FT	8	9	9	8	4	7	6	7	39.1	24.0	32.0	5	18	26.0	28.0	5	18	19.0	19.0	4	6	6	7	40.9	89	101	5	7.5	27.0	29.0	5	12	5	10.5	0
22 FT	8	10	9	8	4	6.5	6	7	38.8	24.0	28.0	5	17	27.0	28.0	5	17	19.0	20.0	4	6.5	5	6	39.0	90	102	5	8	27.0	29.0	5	12	5	10 0	0
24 FT	9	11	9	8	4	6.5	5	6	37.0	25.0	29.0	5	18	26.0	28.0	5	18	19.0	19.0	4	6.5	5	6	39.8	91	103	4	6	27.0	29.0	5	12	5	9.5	o_
26 FT	9	11	9	8	4	6	5	6	36.9	25.0	29.0	5	16	26.0	28.0	5	16	19.0	19.0	4	6	5	6	39.6	91	103	5	8.5	27.0	29.0	5	12	5	8.5	
28 FT	10	12	9	8	4	6	5	6	37.9	30.0	30.0	5	17	26.0	28.0	5	17	19.0	19.0	4	6	5	6	40.3	92	104	4	6	27.0	29.0	5	12	5	8.5	0
30 FT	10	12	9	8	4	6	5	6	37.8	30.0	30.0	5	16	26.0	28.0	5	16	19.0	19.0	4	6	6	7.5	43.1	92	104	5	8.5	27.0	29.0	5	12	5	8.5	Э
32 FT	11	12	10	8	4	6	5	6.5	38.4	31.0	31.0	5	17	26.0	28.0	5	17	18.0	19.0	5	9	5	6.5	39.6	92	104	5	8	27.0	29.0	5	12	5	8 0	
34 FT	11	13	10	8	5	9	5	6.5	38.3	31.0	31.0	5	16	26.0	28.0	5	16	19.0	19.0	5	9	5	6.5	40.4	93	105	5	8.5	28.0	30.0	5	12	5	8 0	
36 FT	12	13	10	8	5	9	5	6.5	39.1	32.0	32.0	5	17	26.0	28.0	5	17	18.0	19.0	5	8.5	5	6.5	40.3	93	105	5	8	27.0	30.0	5	12	5	8 0	
38 FT	12	14	10	8	5	8.5	5	6	39.0	32.0	32.0	5	17	26.0	28.0	5	17	18.0	19.0	5	9	5	6.5	40.9	94	106	5	8.5	28.0	30.0	5	12	5	8 0	
40 FT	12	14	11	8	5	8	5	7	38.9	32.0	32.0	5	16	26.0	28.0	5	16	18.0	19.0	5		5	7	40.8	94	106	5	8	28.0	30.0	5	12	5	7.5	
42 FT	13	14	11	8	5	8.5	5	7	39.6	33.0	33.0	5	17	26.0	28.0	5	17	18.0	19.0	5	8	5	7	40.5	94	106	5	7.5	28.0	30.0	5	12	5	7.5	
44 FT	13	15	11	8	5	8	5	6.5	39.5	33.0	33.0	5	16	26.0	28.0	5	16	18.0	19.0	5	8	5	7	41.3	95	107	5	8	28.0	30.0	5	12	5	7.5	
46 FT	13	15	12	8	5	7.5	5	6.5	39.5	33.0	33.0	5	15	26.0	28.0	5	15	18.0	19.0	5	8	5	6.5	41.0	95	107	5	7.5	28.0	30.0	5	12	5	7 0	
48 FT	14	15	12	8	5	8	5	6.5	40.3	34.0	34.0	5	17	26.0	27.0	5	17	18.0	19.0	5	7.5	5	6.5	40.9	95	107	5	7	28.0	30.0	5	12	5	7 0	
50 FT	14	16	12	8	5	7.5	5	6.5	40.1	34.0	34.0	5	16	26.0	27.0	5	16	18.0	19.0	5	8	5	6.5	41.6	96	108	5	7.5	28.0	30.0	5	12	5	7 0	0



SPECIAL DESIGNS ARE REQUIRED WHEN THE DESIGN FILL IS LESS THAN 1 FOOT OR GREATER THAN 50 FEET.

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MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)



CONCRETE TRIPLE BOX CULVERT

MEMBER THICKNESS BAR SIZE, SPACING & DIMENSIONS

SPAN (S): 5 FEET HEIGHT (HT): 7 THRU 8 FEET

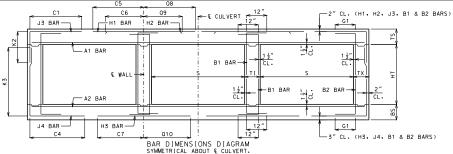
DATE EFFECTIVE: DATE PREPARED: 9/29/2011

703.87

SHEET NO. 5 OF 27

												SPAI	۱ (S) =	6 FT			HE I	GHT (HT) =	= 3	FT O	₹ 4	FT ()R 5	FT											
		MEME	BER									TOP SL	AB B	ARS											Е	BOTTOM	SLAB	BARS						₩AL	L BAI		
DESIGN	T	HICK	NESS	5	A1	BARS			J3	BARS				H1	BARS			H2	BARS		A2	BARS			J4	BARS				H3	BARS		B1	BARS	B2	2 BARS	ذ
FILL	TS	BS	тх	ΤI	SIZE	SPA.	SIZE	SPA.	C1	HT=3'	K2 HT=4'	HT=5'	SIZE	SPA.	C5	08	SIZE	SPA.	C6	09	SIZE	SPA.	SIZE	SPA.	C4	HT=3'	K3 HT=4'	HT=5'	SIZE	SPA.	C7	010	SIZE	SPA.	SIZE	SPA.	G1
1 FT	11	8	8	8	5	8	4	9.5	37.5	27.0	27.0	27.0	4	17	64.5	48.5	4	17	24.0	23.0	4	10	4	10	38.1	40	52	64	4	7.5	33.0	34.0	5	12	5	12	12
2 FT	11	8	8	8	5	8	4	9.5	37.5	27.0	27.0	27.0	4	17	64.5	48.5	4	17	23.0	22.0	4	9.5	4	9	35.1	40	52	64	4	7	33.0	34.0	5	12	5	12	12
4 FT	8	8	8	8	4	7.5	4	8.5	35.8	24.0	24.0	24.0	4	14	43.0	52.0	4	14	21.0	21.0	4	9	4	9.5	32.1	40	52	64	4	6.5	32.0	33.0	5	12	5	12	12
6 FT	8	8	8	8	4	9	4	9.5	32.6	24.0	24.0	24.0	4	14	35.0	38.0	4	14	21.0	20.0	4	8.5	4	8.5	30.0	40	52	64	4	6	31.0	32.0	5	12	5	12	12
8 FT	8	8	8	8	4	9	4	9	30.4	24.0	24.0	24.0	4	13	33.0	35.0	4	13	20.0	20.0	4	8	4	8	29.0	40	52	64	5	7.5	30.0	32.0	5	12	5	12	0
10 FT	8	8	8	8	4	8	4	8	29.4	24.0	24.0	24.0	4	12	32.0	34.0	4	12	20.0	20.0	4	7	4	7	28.4	40	52	64	5	6.5	30.0	32.0	5	12	5	12	0
12 FT	8	9	8	8	4	7	4	7	28.8	24.0	24.0	24.0	5	17	31.0	33.0	5	17	20.0	20.0	4	6.5	4	9	27.4	41	53	65	5	7	30.0	32.0	5	12	5	12	0
14 FT	8	9	8	8	4	6.5	4	6.5	28.3	24.0	24.0	24.0	5	16	31.0	32.0	5	16	21.0	21.0	5	9	4	8	26.9	41	53	65	5	6.5	30.0	32.0	5	12	5	12	0
16 FT	9	10	8	8	4	6	4	7.5	27.6	25.0	25.0	25.0	5	16	30.0	33.0	5	16	20.0	20.0	5	9	4	9.5	26.5	42	54	66	5	7	29.0	32.0	5	12	5	12	0
18 FT	9	10	8	8	5	9	4	6.5	27.4	25.0	25.0	25.0	5	16	30.0	32.0	5	16	21.0	21.0	5	8	4	8.5	26.3	42	54	66	5	6.5	29.0	32.0	5	12	5	12	0
20 FT	10	11	8	8	5	9	4	7	27.0	26.0	26.0	26.0	5	15	30.0	33.0	5	15	20.0	20.0	5	8	4	8.5	26.0	43	55	67	5	7	29.0	33.0	5	12	5	12	0
22 FT	10	11	8	8	5	8.5	4	6.5	26.0	26.0	26.0	26.0	5	15	29.0	32.0	5	15	20.0	20.0	5	7.5	4	8.5	25.0	43	55	67	5	7	29.0	33.0	5	12	5	12	0
24 FT	11	12	8	8	5	8.5	4	6.5	25.8	27.0	27.0	27.0	5	15	29.0	32.0	5	15	20.0	20.0	5	8	4	8.5	24.9	44	56	68	5	7	29.0	33.0	5	12	5	12	0
26 FT	11	12	8	8	5	7.5	4	6	25.6	27.0	27.0	27.0	5	14	29.0	32.0	5	14	20.0	20.0	5	6.5	4	8	24.9	44	56	68	5	6.5	29.0	33.0	5	12	5	12	0
28 FT	12	13	8	8	5	7.5	4	6.5	25.5	28.0	28.0	28.0	5	14	29.0	32.0	5	14	19.0	20.0	5	7.5	4	8	24.9	45	57	69	5	7	29.0	33.0	5	12	5	12	0
30 FT	12	14	8	8	5	7	4	6	25.6	28.0	28.0	28.0	5	13	29.0	32.0	5	13	19.0	20.0	5	7.5	4	7.5	24.8	46	58	70	5	7	28.0	33.0	5	12	5	12	0
32 FT	13	14	8	8	5	7	4	6	25.4	29.0	29.0	29.0	5	14	28.0	33.0	5	14	19.0	20.0	5	7	4	7.5	24.9	46	58	70	5	6.5	28.0	33.0	5	12	5	12	0
34 FT	13	15	8	8	5	7	5	8.5	25.6	29.0	29.0	29.0	5	13	28.0	32.0	5	13	19.0	20.0	5	7	4	7	24.8	47	59	71	5	7	28.0	33.0	5	12	5	12	0
36 FT	14	15	8	8	5	7	4	6	25.4	30.0	30.0	30.0	5	13	28.0	33.0	5	13	19.0	20.0	5	6.5	4	7	25.0	47	59	71	5	6.5	28.0	33.0	5	12	5	12	0
38 FT	14	16	8	8	5	6.5	5	8.5	25.5	30.0	30.0	30.0	5	13	28.0	32.0	5	13	19.0	20.0	5	7	4	6.5	24.9	48	60	72	5	6.5	28.0	33.0	5	12	5	12	0
40 FT	15	16	8	8	5	6.5	5	8	30.4	31.0	31.0	31.0	5	13	33.0	38.0	5	13	24.0	25.0	5	6.5	4	6.5	25.1	48	60	72	5	6.5	28.0	33.0	5	12	5	12	0
42 FT	15	17	8	8	5	6.5	5	8	30.6	31.0		31.0	5	12	33.0	37.0	5	12	24.0	25.0	5	6.5	4	6	25.1	49	61	73	5	6.5	28.0	33.0	5	12	5	12	0
44 FT	16	17	8	8	5	6.5	5	7	30.5	32.0		32.0	5	13	33.0	37.0	5	13	24.0	25.0	5	6.5	4	6	25.3	49	61	73	5	6	28.0	33.0	5	12	5	12	0
46 FT	16	17	8	8	5	6	5	7	30.5	32.0	32.0	32.0	5	12	33.0	37.0	5	12	24.0	25.0	5	6	4	6	25.3	49	61	73	5	6	28.0	33.0	5	12	5	12	0
48 FT	17	18	8	8	5	6	5	6.5	30.6	37.0	37.0	37.0	5	13	33.0	37.0	5	13	24.0	25.0	5	6	5	6.5	25.5	50	62	74	5	6	28.0	33.0	5	12	5	11	0
50 FT	17	18	8	8	5	6	5	6.5	30.6	37.0	37.0	37.0	5	12	33.0	37.0	5	12	24.0	25.0	5	6	5	6.5	25.4	50	62	74	5	6	28.0	33.0	5	12	5	10.5	0

												SPA	AN (S	5) = 6	FT			HEIC	HT (F	IT)	= 6	FT (OR 7	FT											
		MEM										TOP	SLAB												BOTTOM	SLAB I	BARS					₩AL			
DESIGN		LHICK	NESS		A1	BARS			J:	BARS			H1	BARS			H2	BARS		A2	BARS			J4	BARS			Н3	BARS		B1	BARS	B2	2 BARS	
FILL	TS	BS	TX	ΤI	SIZE	SPA.	SIZE	SPA.	C1		2 HT=7'	SIZE	SPA.	C5	08	SIZE	SPA.	C6	09	SIZE	SPA.	SIZE	SPA.	C4	HT=6'	3 HT=7'	SIZE	SPA.	C7	010	SIZE	SPA.	SIZE	SPA.	G1
1 FT	11	8	8	8	5	8	4	9.5	37.5	27.0	27.0	4	17	64.5	48.5	4	17	24.0	24.0	4	9.5	4	7.5	52.8	76	88	4	7	34.0	34.0	5	12	5	12	12
2 FT	11	8	8	8	5	8	4	9.5	37.5	27.0	27.0	4	17	64.5	48.5	4	17	23.0	23.0	4	8.5	4	7	47.3	76	88	4	6.5	33.0	34.0	5	12	5	12	12
4 FT	8	8	8	8	4	7	4	7	37.5	24.0	24.0	4	14	64.5	52.0	4	14	21.0	22.0	4	8.5	4	7	43.0	76	88	4	6.5	32.0	34.0	5	12	5	12	12
6 FT	8	8	8	8	4	8.5	4	7.5	41.9	24.0	24.0	4	14	37.0	39.0	4	14	21.0	21.0	4	8	4	6.5	39.1	76	88	4	6	31.0	33.0	5	12	5	12	12
8 FT	8	8	8	8	4	8.5	4	7	37.6	24.0	24.0	4	13	34.0	35.0	4	13	20.0	20.0	4	7.5	4	6	36.9	76	88	5	7	30.0	32.0	5	12	5	12	0
10 FT	8	8	8	8	4	8	4	6	36.0	24.0	24.0	4	12	32.0	34.0	4	12	20.0	20.0	4	6.5	5	6	35.4	76	88	5	6.5	30.0	32.0	5	12	5	12	0
12 FT	8	9	8	8	4	7	5	6.5	34.8	24.0	24.0	5	17	31.0	33.0	5	17	20.0	20.0	4	6.5	4	6	35.0	77	89	5	7	30.0	32.0	5	12	5	12	0
14 FT	8	9	8	8	4	6	5	6	33.9	24.0	28.0	5	16	31.0	33.0	5	16	21.0	21.0	5	8.5	5	6.5	34.1	77	89	5	6.5	30.0	32.0	5	12	5	12	0
16 FT	9	10	8	8	4	6	5	6.5	33.8	25.0	25.0	5	16	30.0	33.0	5	16	20.0	20.0	5	9	4	6	34.0	78	90	5	7	29.0	33.0	5	12	5	12	0
18 FT	9	10	8	8	5	9	5	6.5	33.4	25.0	29.0	5	16	30.0	32.0	5	16	21.0	21.0	5	8	5	6.5	33.6	78	90	5	6.5	29.0	32.0	5	12	5	12	0
20 FT	9	11	8	8	5	8	5	6	33.1	25.0	29.0	5	16	30.0	32.0	5	16	21.0	22.0	5	8	5	7	33.8	79	91	5	7.5	29.0	33.0	5	12	5	12	0
22 FT	10	11	8	8	5	8.5	5	7	31.6	26.0	30.0	5	15	29.0	32.0	5	15	20.0	20.0	5	7.5	5	7	31.9	79	91	5	7	29.0	33.0	5	12	5	12	0
24 FT	10	12	8	8	5	7.5	5	6.5	31.6	26.0	30.0	5	15	29.0	32.0	5	15	20.0	21.0	5	8	5	7.5	32.0	80	92	5	7	29.0	33.0	5	12	5		0
26 FT	11	13	8	8	5	8	5	6.5	31.9	27.0	31.0	5	14	29.0	32.0	5	14	20.0	20.0	5	8	5	7.5	32.3	81	93	5	7.5	29.0	33.0	5	12	5	11	0
28 FT	12	13	8	8	5	8	5	7	31.9	28.0	32.0	5	14	29.0	32.0	5	14	19.0	20.0	5	7.5	5	7	32.3	81	93	5	7	29.0	33.0	5	12	5	10	0
30 FT	12	14	8	8	5	7.5	5	6.5	32.0	28.0	32.0	5	13	29.0	32.0	5	13	19.0	20.0	5	7.5	5	7.5	32.4	82	94	5	7	29.0	33.0	5	12	5		0
32 FT	13	14	8	8	5	7.5	5	6.5	32.0	33.0	33.0	5	14	28.0	32.0	5	14	19.0	20.0	5	7	5	7	32.5	82	94	5	6.5	29.0	33.0	5	12	5		0
34 FT	13	15	8	8	5	7	5	6.5	32.1	33.0	33.0	5	13	28.0	32.0	5	13	19.0	20.0	5	7	5	7	32.6	83	95	5	7	29.0	33.0	5	12	5	9.5	0
36 FT	14	15	8	8	5	7	5	6	32.3	34.0	34.0	5	14	28.0	32.0	5	14	19.0	20.0	5	7	5	6.5	32.8	83	95	5	6.5	29.0	33.0	5	12	5		0
38 FT	14	16	9	8	5	6.5	5	7	32.9	30.0	34.0	5	13	28.0	32.0	5	13	19.0	20.0	5	7	5	8	33.1	84	96	5	6.5	29.0	33.0	5	12	5		0
40 FT	14	16	10	8	5	6	5	7.5	33.3	30.0	34.0	5	12	28.0	32.0	5	12	19.0	20.0	5	6.5	5	7.5	33.4	84	96	5	6.5	29.0	33.0	5	12	5		0
42 FT	15	17	10	8	5	6.5	5	7.5	38.5	31.0	35.0	5	13	33.0	37.0	5	13	24.0	25.0	5	7	5	7.5	33.6	85	97	5	6.5	29.0	33.0	5	12	5	9	0
44 FT	15	17	10	8	5	6.5	5	7.5	38.5	31.0	35.0	5	12	33.0	37.0	5	12	24.0	25.0	5	6.5	5	7.5	33.6	85	97	5	6	29.0	33.0	5	12	5		0
46 FT	16	17	10	8	5	6.5	5	7	38.6	32.0	36.0	5	13	33.0	36.0	5	13	24.0	25.0	5	6	5	7.5	33.8	85	97	5	6	29.0	33.0	5	12	5	8	0
48 FT	16	18	11	8	5	6	5	7	39.3	32.0	36.0	5	12	33.0	36.0	5	12	24.0	25.0	5	6.5	5	7.5	34.1	86	98	5	6	29.0	34.0	5	12	5		0
50 FT	17	18	11	8	5	6	5	7	39.4	33.0	37.0	5	13	33.0	36.0	5	13	24.0	25.0	5	6	5	7.5	34.3	86	98	5	6	29.0	33.0	5	12	5	8	0
							C			O8																									



SPECIAL DESIGNS ARE REQUIRED WHEN THE DESIGN FILL IS LESS THAN 1 FOOT OR GREATER THAN 50 FEET.

DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.

DESIGN FILLS ARE MEASURED FROM THE TOP OF TOP SLAB TO THE TOP OF EARTH FILL OR ROADWAY.

CULVERTS MEET STRENGTH AND SERVICEABILITY REQUIREMENTS FOR THE DESIGN VEHICULAR LIVE LOAD HL-93 MINUS THE LANE LOAD.



MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)



CONCRETE TRIPLE BOX CULVERT

MEMBER THICKNESS BAR SIZE, SPACING & DIMENSIONS

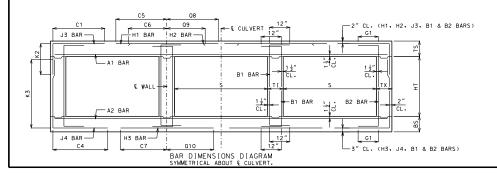
SPAN (S): 6 FEET HEIGHT (HT): 3 THRU 7 FEET

DATE EFFECTIVE: DATE PREPARED: 9/29/2011

703.87

SHEET NO. 6 OF 27

												SPA	N (S	.) = 6	FT			HEIG	HT (F	HT)	= 8	FT (OR 9	FT										
		MEM										TOP :	SLAB	BARS										Е	MOTTO	SLAB E	BARS					WAL	L BAI	
DESIGN		THICK	NESS		A1 (BARS			J3	BARS			H1	BARS			H2	BARS		A2	BARS			J4	BARS			Н3	BARS		B1	BARS	B2	BARS
FILL	TS	BS	тх	ΤI	SIZE	SPA.	SIZE	SPA.	C1	HT=8'	12 HT=9'	SIZE	SPA.	C5	08	SIZE	SPA.	C6	09	SIZE	SPA.	SIZE	SPA.	C4	HT=8'	3 HT=9'	SIZE	SPA.	C7	010	SIZE	SPA.	SIZE	SPA. G1
1 FT	11	8	8	8	5	7.5	4	7	37.5	27.0	27.0	4	17	64.5	48.5	4	17	24.0	25.0	4	8.5	5	6.5	54.0	100	112	4	7	52.0	35.0	5	12	5	12 12
2 FT	11	8	8	8	5	7.5	4	6.5	37.5	27.0	27.0	4	17	64.5	48.5	4	17	23.0	24.0	4	8	5	6	54.0	100	112	4	6.5	35.0	34.0	5	12	5	12 12
4 FT	8	8	9	8	4	7	4	6	38.1	24.0	24.0	4	14	64.5	52.0	4	14	22.0	22.0	4	8	5	6.5	54.8	100	112	4	6	33.0	34.0	5	12	5	12 12
6 FT	8	8	9	8	4	8.5	4	6	38.1	24.0	24.0	4	14	64.5	40.0	4	14	21.0	21.0	4	8	5	6	50.8	100	112	4	6	32.0	33.0	5	12	5	12 12
8 FT	8	9	9	8	4	8.5	4	6	50.1	24.0	24.0	4	14	35.0	35.0	4	14	20.0	20.0	4	8.5	5	6.5	50.8	101	113	4	6.5	31.0	33.0	5	12	5	12 0
10 FT	8	9	9	8	4	8	5	6.5	45.8	24.0	28.0	4	12	33.0	33.0	4	12	20.0	20.0	4	7.5	5	6	47.5	101	113	4	6	31.0	33.0	5	12	5	11 0
12 FT	8	9	10	8	4	7	5	6.5	43.0	24.0	28.0	5	17	32.0	33.0	5	17	20.0	20.0	4	6.5	5	6.5	44.8	101	113	5	7	30.0	32.0	5	12	5	11 0
14 FT	8	9	10	8	4	6.5	5	6	41.6	28.0	28.0	5	17	31.0	32.0	5	17	21.0	21.0	4	6	5	6	43.5	101	113	5	6.5	30.0	32.0	5	12	5	10 0
16 FT	8	10	10	8	4	6	6	7	43.3	28.0	28.0	5	16	30.0	32.0	5	16	22.0	22.0	5	9	5	6	44.4	102	114	5	7	30.0	33.0	5	12	5	9.5 0
18 FT	9	10	10	8	4	6	5	6	41.8	29.0	29.0	5	16	30.0	32.0	5	16	20.0	21.0	5	8.5	6	7.5	46.4	102	114	5	7	30.0	32.0	5	12	5	9 0
20 FT	9	11	10	8	5	8.5	5	6	41.0	29.0	29.0	5	16	30.0	32.0	5	16	21.0	22.0	5	8.5	5	6	44.4	103	115	5	7	30.0	33.0	5	12	5	8.5 0
22 FT	10	11	10	8	5	9	5	6.5	39.9	30.0	30.0	5	15	29.0	32.0	5	15	20.0	20.0	5	8	5	6	41.4	103	115	5	7	30.0	33.0	5	12	5	9 0
24 FT	10	12	10	8	5	8	5	6.5	39.5	30.0	30.0	5	15	29.0	32.0	5	15	20.0	21.0	5	8	5	6	42.3	104	116	5	7	30.0	33.0	5	12	5	8.5 0
26 FT	11	12	10	8	5	8	5	6	40.5	31.0	31.0	5	14	29.0	32.0	5	14	19.0	20.0	5	7	5	6	41.9	104	116	5	6.5	30.0	33.0	5	12	5	8 0
28 FT	11	13	10	8	5	7.5	5	6	40.3	31.0	31.0	5	14	29.0	32.0	5	14	20.0	20.0	5	7.5	5	6	42.8	105	117	5	7	30.0	33.0	5	12	5	8 0
30 FT	12	14	10	8	5	8	5	6	41.0	32.0	32.0	5	14	29.0	31.0	5	14	19.0	20.0	5	8	5	6	43.3	106	118	5	7	30.0	33.0	5	12	5	8 0
32 FT	12	14	11	8	5	7.5	5	6.5	40.8	32.0	32.0	5	13	29.0	31.0	5	13	19.0	20.0	5	7.5	5	7	42.9	106	118	5	6.5	30.0	33.0	5	12	5	7.5 0
34 FT	13	15	11	8	5	7.5	5	6.5	41.5	33.0	33.0	5	13	28.0	31.0	5	13	19.0	20.0	5	7.5	5	7	43.5	107	119	5	7	30.0	33.0	5	12	5	7.5 0
36 FT	13	15	11	8	5	7	5	6	41.4	33.0	33.0	5	13	28.0	31.0	5	13	19.0	20.0	5	7	5	6.5	43.4	107	119	5	6.5	30.0	33.0	5	12	5	7.5 0
38 FT	14	16	12	8	5	7	5	6.5	42.1	34.0	34.0	5	13	28.0	31.0	5	13	19.0	20.0	5	7	5	6.5	43.8	108	120	5	6.5	30.0	33.0	5	12	5	7 0
40 FT	14	16	12	8	5	7	5	6	42.0	34.0	34.0	5	13	28.0	31.0	5	13	19.0	20.0	5	7	5	6.5	43.6	108	120	5	6.5	30.0	33.0	5	12	5	7 0
42 FT	15	17	12	8	5	7	5	6	47.6	35.0	35.0	5	13	33.0	36.0	5	13	24.0	25.0	5	7	5	6.5	44.3	109	121	5	6.5	30.0	33.0	5	12	5	7 0
44 FT	15	17	13	8	5	6.5	5	6	47.6	35.0	35.0	5	13	33.0	36.0	5	13	24.0	25.0	5	6.5	5	6	44.0	109	121	5	6	30.0	33.0	5	12	5	6.5 0
46 FT	15	17	13	8	5	6	5	6	47.6	35.0	35.0	5	12	33.0	36.0	5	12	24.0	25.0	5	6	5	6	43.9	109	121	5	6	30.0	33.0	5	12	5	6.5 0
48 FT	16	18	13	8	5	6.5	5	6	48.3	36.0	36.0	5	13	33.0	35.0	5	13	24.0	25.0	5	6.5	5	6	44.5	110	122	5	6	30.0	33.0	5	12	5	6.5 0
50 FT	16	18	14	8	5	6	5	6	48.3	36.0	36.0	5	12	33.0	35.0	5	12	24.0	25.0	5	6	5	6	44.3	110	122	6	8.5	32.0	37.0	5	12	5	6.5 0



SPECIAL DESIGNS ARE REQUIRED WHEN THE DESIGN FILL IS LESS THAN 1 FOOT OR GREATER THAN 50 FEET.

DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.

DESIGN FILLS ARE MEASURED FROM THE TOP OF TOP SLAB TO THE TOP OF EARTH FILL OR ROADWAY.

CULVERTS MEET STRENGTH AND SERVICEABILITY REQUIREMENTS FOR THE DESIGN VEHICULAR LIVE LOAD HL-93 MINUS THE LANE LOAD.



MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)



CONCRETE TRIPLE BOX CULVERT

MEMBER THICKNESS BAR SIZE, SPACING & DIMENSIONS

SPAN (S): 6 FEET HEIGHT (HT): 8 THRU 9 FEET SHEET NO.

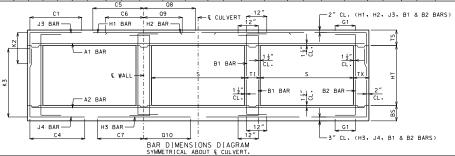
DATE EFFECTIVE: DATE PREPARED: 9/29/2011

703.87

7 OF 27

												SPAN	1 (S) =	7 FT			HE I	GHT (HT) =	= 4	FT O	R 5	FT (DR 6	FT										
		MEME	ER									TOP SL	AB B													воттом	SLAB I	BARS							L BAF	
DESIGN		HICK	NESS		A1 E	ARS			J:	BARS				H1	BARS			H2	BARS		A2	BARS			J4	BARS				Н3	BARS		B1	BARS	B2	BARS
FILL	TS	вѕ	тх	TIS	ΙZΕ	SPA.	SIZE	SPA.	C1	HT=4'	K2 HT=5'	HT=6'	SIZE	SPA.	C5	08	SIZE	SPA.	C6	09	SIZE	SPA.	SIZE	SPA.	C4	HT=4'	K3 HT=5'	HT=6'	SIZE	SPA.	C7	010	SIZE	SPA.	SIZE	SPA. G1
1 FT	12	8	8	8	5	7.5	4	8.5	41.1	28.0	28.0	28.0	4	16	72.5	54.5	4	16	25.0	25.0	4	8.5	4	7.5	42.5	52	64	76	4	6	36.0	37.0	5	12	5	12 12
2 FT	12	8	8	8	5	7.5	4	8.5	41.1	28.0	28.0	28.0	4	15	72.5	54.5	4	15	24.0	24.0	4	7.5	4	7	39.0	52	64	76	5	7.5	35.0	37.0	5	12	5	12 12
4 FT	8	8	8	8	4	6	4	6.5	39.5	24.0	24.0	24.0	5	17	47.0	58.0	5	17	23.0	23.0	4	7	4	7	36.0	52	64	76	5	7	35.0	37.0	5	12	5	12 12
6 FT	8	8	8	8	4	6.5	4	7	36.0	24.0	24.0	24.0	5	17	38.0	42.0	5	17	22.0	22.0	4	6.5	4	6.5	33.4	52	64	76	5	6.5	34.0	36.0	5	12	5	12 12
8 FT	8	8	8	8	4	6.5	4	6.5	33.5	24.0	24.0	24.0	5	17	36.0	38.0	5	17	23.0	22.0	5	9	4	6	32.0	52	64	76	5	6	33.0	35.0	5	12	5	12 0
10 FT	8	9	8	8	4	6	5	7	32.3	24.0	24.0	24.0	5	16	35.0	37.0	5	16	23.0	23.0	5	9	4	7	30.9	53	65	77	5	6.5	33.0	35.0	5	12	5	12 0
12 FT	8	9	8	8	4	6	5	6	31.4	24.0	24.0	24.0	5	14	34.0	36.0	5	14	23.0	23.0	5	7.5	4	6	30.1	53	65	77	5	6	32.0	35.0	5	12	5	12 0
14 FT	9	10	8	8	5	8.5	4	6	30.5	25.0	25.0	25.0	5	15	33.0	36.0	5	15	23.0	23.0	5	7.5	4	7	29.5	54	66	78	5	6	32.0	36.0	5	12	5	12 0
16 FT	10	11	8	8	5	8	5	8	29.9	26.0	26.0	26.0	5	15	33.0	36.0	5	15	22.0	22.0	5	7.5	4	7	29.0	55	67	79	5	6.5	32.0	36.0	5	12	5	12 0
18 FT	10	11	8	8	5	8	5	7.5	29.5	26.0	26.0	26.0	5	15	33.0	36.0	5	15	23.0	24.0	5	6	4	6.5	28.6	55	67	79	5	6	32.0	36.0	5	12	5	12 0
20 FT	11	12	8	8	5	7.5	5	8.5	29.1	27.0	27.0	27.0	5	14	32.0	36.0	5	14	22.0	23.0	5	6.5	4	6.5	28.4	56	68	80	5	6	31.0	36.0	5	12	5	12 0
22 FT	12	13	8	8	5	7	5	8.5	28.9	28.0	28.0	28.0	5	13	32.0	36.0	5	13	21.0	22.0	5	6.5	4	6	28.3	57	69	81	5	6	31.0	36.0	5	12	5	12 0
24 FT	12	13	8	8	5	7	5	8.5	27.6	28.0	28.0	28.0	5	13	31.0	36.0	5	13	21.0	22.0	5	6	4	6	27.1	57	69	81	6	8	34.0	39.0	5	12	5	12 0
26 FT	13	14	8	8	5	6.5	5	8.5	27.5	29.0	29.0	29.0	5	12	31.0	36.0	5	12	20.0	21.0	5	6.5	4	6	27.1	58	70	82	5	6	31.0	36.0	5	12	5	12 0
28 FT	13	15	8	8	5	6.5	5	8.5	27.6	29.0	29.0	29.0	5	12	31.0	36.0	5	12	21.0	22.0	5	6.5	4	6.5	27.0	59	71	83	5	6	31.0	37.0	5	12	5	12 0
30 FT	14	15	8	8	5	6	5	8.5	27.5	30.0	30.0	34.0	5	12	31.0	36.0	5	12	20.0	21.0	5	6	5	8.5	27.1	59	71	83	6	8	34.0	39.0	5	12	5	12 0
32 FT	15	16	8	8	5	6	5	8	32.5	31.0	31.0	35.0	6	17	39.0	45.0	6	17	29.0	30.0	5	6	5	- 8	27.3	60	72	84	6	8	34.0	40.0	5	12	5	12 0
34 FT	15	17	8	8	5	6	5	8	32.6	31.0	31.0	31.0	6	16	39.0	45.0	6	16	29.0	30.0	5	6	4	6	27.3	61	73	85	6	8.5	34.0	40.0	5	12	5	11.5 0
36 FT	16	17	8	8	5	6	5	7	32.5	32.0	32.0	36.0	6	16	39.0	45.0	6	16	29.0	30.0	6	8.5	5	7	27.4	61	73	85	6	8	34.0	40.0	5	12	5	11 0
38 FT	16	18	8	8	6	8	5	7	32.6	32.0	36.0	36.0	6	15	39.0	45.0	6	15	29.0	30.0	5	9	5	6.5	27.4	62	74	86	6	8	34.0	40.0	5	12	5	10 0
40 FT	17	18	8	8	6	8	5	6.5	32.6	37.0	37.0	37.0	6	16	39.0	45.0	6	16	29.0	30.0	6	8	5	6.5	27.6	62	74	86	6	7.5	34.0	40.0	5	12	5	9.5 0
42 FT	17	19	8	8	6	7.5	5	6.5	32.8	37.0	37.0	37.0	6	15	39.0	45.0	6	15	29.0	30.0	6	8	5	6.5	27.6	63	75	87	6	8	34.0	40.0	5	12	5	9.5 0
44 FT	18	19	8	8	6	7.5	5	6.5	32.6	38.0	38.0	38.0	6	15	39.0	45.0	6	15	29.0	30.0	6	7.5	5	6.5	27.8	63	75	87	6	7.5	34.0	40.0	5	12	5	9.5 0
46 FT	18	20	8	8	6	7.5	5	6.5	32.8	38.0	38.0	38.0	6	15	39.0	44.0	6	15	29.0	30.0	6	8	5	6	27.8	64	76	88	6	7.5	34.0	40.0	5	12	5	9.5 0
48 FT	19	20	8	8	6	7.5	5	6	32.8	39.0	39.0	39.0	6	15	39.0	44.0	6	15	29.0	30.0	6	7.5	5	6	27.9	64	76	88	6	7	34.0	40.0	5	12	5	9.5 0
50 FT	19	21	8	8	6	7	5	6	32.9	39.0	39.0	39.0	6	14	39.0	44.0	6	14	29.0	30.0	6	7.5	6	7.5	31.0	65	77	89	6	7.5	34.0	40.0	5	12	5	9 0

												SPA	AN (S	5) = 7	7 FT			HEIG	HT (F	HT)	= 7	FT (OR 8	FT										
		MEM										TOP :	SLAB	BARS										E	BOTTOM	SLAB	BARS					WAL	L BAF	₹S
DESIGN		THIC	(NES	S	Α1	BARS			J3	BARS			H1	BARS			Н2	BARS		A2	BARS			J4	BARS			Н3	BARS		B1 8	BARS	B2	BARS
FILL	TS	вѕ	ТX	ΤI	SIZE	SPA.	SIZE	SPA.	C1	HT=7'	12 HT=8'	SIZE	SPA.	C5	08	SIZE	SPA.	C6	09	SIZE	SPA.	SIZE	SPA.	C4	HT=7'	3 HT=8'	SIZE	SPA.	C7	010	SIZE	SPA.	SIZE	SPA. G1
1 FT	12	8	8	8	5	7.5	4	8	41.1	28.0	28.0	4	16	72.5	54.5	4	16	25.0	26.0	4	8	4	6	57.4	88	100	4	6	37.0	37.0	5	12	5	12 12
2 FT	12	8	8	8	5	7.5	4	7.5	41.1	28.0	28.0	4	15	72.5	54.5	4	15	25.0	25.0	4	7	5	6.5	51.3	88	100	5	7	36.0	37.0	5	12	5	12 12
4 FT	8	8	9	8	4	6	4	6	41.8	24.0	24.0	5	17	73.5	58.0	5	17	23.0	23.0	4	7	4	6.5	45.9	88	100	5	7	35.0	37.0	5	12	5	12 12
6 FT	8	8	9	8	4	6.5	4	6	44.3	24.0	24.0	5	17	40.0	43.0	5	17	22.0	22.0	4	6.5	5	6.5	41.8	88	100	5	6.5	34.0	36.0	5	12	5	12 12
8 FT	8	8	9	8	4	6.5	4	6	40.9	24.0	24.0	5	17	37.0	38.0	5	17	22.0	23.0	5	9	5	6	39.9	88	100	5	6	33.0	35.0	5	12	5	12 0
10 FT	8	9	9	8	4	6	5	6.5	39.1	24.0	28.0	5	16	35.0	37.0	5	16	23.0	23.0	5	9	5	7	39.4	89	101	5	6.5	33.0	36.0	5	12	5	12 0
12 FT	8	9	9	8	4	6	6	7	41.0	24.0	28.0	5	15	34.0	36.0	5	15	23.0	24.0	5	7	5	6	38.3	89	101	5	6	32.0	35.0	5	12	5	12 0
14 FT	9	10	9	8	5	8.5	5	6	37.8	25.0	29.0	5	15	34.0	36.0	5	15	23.0	23.0	5	7.5	5	6.5	37.9	90	102	5	6	32.0	36.0	5	12	5	12 0
16 FT	10	11	9	8	5	8	5	7	37.4	26.0	30.0	5	15	33.0	36.0	5	15	22.0	22.0	5	7.5	5	7	37.6	91	103	5	6.5	32.0	36.0	5	12	5	12 0
18 FT	10	11	9	8	5	8	5	6.5	36.8	30.0	30.0	5	15	33.0	36.0	5	15	23.0	23.0	5	6	5	6.5	36.9	91	103	5	6	32.0	36.0	5	12	5	12 0
20 FT	11	12	9	8	5	7.5	5	6.5	36.8	31.0	31.0	5	14	32.0	36.0	5	14	21.0	22.0	5	7	5	6.5	37.0	92	104	5	6	32.0	36.0	5	12	5	11 0
22 FT	11	13	9	8	5	7	5	6	36.5	31.0	31.0	5	14	32.0	35.0	5	14	22.0	23.0	5	7	5	7	37.0	93	105	5	6	32.0	36.0	5	12	5	10 0
24 FT	12	13	9	8	5	7	5	7	34.8	32.0	32.0	5	13	31.0	35.0	5	13	21.0	22.0	5	6	5	7	35.0	93	105	6	8	34.0	39.0	5	12	5	10.5 0
26 FT	13	14	9	8	5	7	5	7	34.9	33.0	33.0	5	12	31.0	35.0	5	12	20.0	21.0	5	6.5	5	7.5	35.3	94	106	5	6	31.0	36.0	5	12	5	9.5 0
28 FT	13	15	9	8	5	6.5	5	6.5	34.9	33.0	33.0	5	12	31.0	35.0	5	12	21.0	22.0	5	6.5	5	7.5	35.4	95	107	5	6	31.0	36.0	5	12	5	9 0
30 FT	14	15	9	8	5	6.5	5	7	35.0	34.0	34.0	5	12	31.0	35.0	5	12	20.0	21.0	5	6	5	7	35.4	95	107	6	8	34.0	39.0	5	12	5	8.5 0
32 FT	14	16	9	8	5	6	5	6	35.0	34.0	34.0	5	12	31.0	35.0	5	12	20.0	21.0	5	6	5	7	35.5	96	108	6	8	35.0	39.0	5	12	5	8.5 0
34 FT	15	17	10	8	5	6	5	7	40.8	35.0	35.0	6	16	40.0	44.0	6	16	29.0	30.0	5	6	5	7.5	36.0	97	109	6	8.5	35.0	40.0	5	12	5	8.5 0
36 FT	16	17	10	8	5	6	5	7	40.8	36.0	36.0	6	17	39.0	44.0	6	17	29.0	30.0	5	6	5	7.5	36.0	97	109	6	8	35.0	40.0	5	12	5	8 0
38 FT	16	18	11	8	5	6	5	7	41.5	36.0	36.0	6	16	39.0	44.0	6	16	29.0	30.0	5	6	5	7	36.5	98	110	6	8	35.0	40.0	5	12	5	8.5 0
40 FT	17	18	11	8	5	6	5	7	41.5	37.0	37.0	6	16	39.0	43.0	6	16	29.0	30.0	6	8	5	7	36.5	98	110	6	7.5	35.0	40.0	5	12	5	8 0
42 FT	17	19	11	8	6	8	5	6.5	41.6	37.0	37.0	6	16	39.0	43.0	6	16	29.0	30.0	6	8.5	5	7	36.8	99	111	6	7.5	35.0	40.0	5	12	5	7.5 0
44 FT	18	19	12	8	6	8	5	6.5	42.3	38.0	38.0	6	16	39.0	43.0	6	16	29.0	29.0	6	8	5	6.5	37.0	99	111	6	7.5	35.0	40.0	5	12	5	8 0
46 FT	18	20	12	8	6	8	5	6.5	42.4	38.0	38.0	6	15	39.0	43.0	6	15	29.0	29.0	6	8	5	6.5	37.1	100	112	6	7.5	35.0	40.0	5	12	5	7.5 0
48 FT		20	12	8	6	7.5	5	6.5	42.4	38.0	38.0	6	15	39.0	43.0	6	15	29.0	29.0	6	7.5	5	6.5	37.1	100	112	6	7	35.0	40.0	5	12	5	7.5 0
50 FT	19	21	12	8	6	7.5	5	6	42.5	39.0	39.0	6	15	39.0	43.0	6	15	28.0	29.0	6	8	5	6.5	37.5	101	113	6	7.5	35.0	40.0	5	12	5	7 0



SPECIAL DESIGNS ARE REQUIRED WHEN THE DESIGN FILL IS LESS THAN 1 FOOT OR GREATER THAN 50 FEET.

DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.

DESIGN FILLS ARE MEASURED FROM THE TOP OF TOP SLAB TO THE TOP OF EARTH FILL OR ROADWAY.

CULVERTS MEET STRENGTH AND SERVICEABILITY REQUIREMENTS FOR THE DESIGN VEHICULAR LIVE LOAD HL-93 MINUS THE LANE LOAD.



MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)



CONCRETE TRIPLE BOX CULVERT

MEMBER THICKNESS BAR SIZE, SPACING & DIMENSIONS

SPAN (S): 7 FEET HEIGHT (HT): 4 THRU 8 FEET

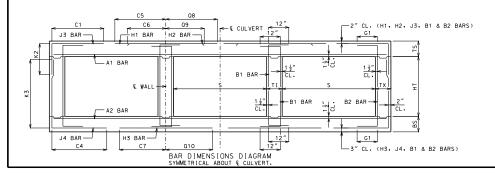
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED DATE EFFECTIVE: DATE PREPARED:

9/29/2011

703.87

SHEET NO. 8 OF 27

												SPAN	1 (S)	= 7	FT			HE I GH	IT (HI) =	9 F	T OF	₹ 10												
		MEM										TOP :	SLAB													SLAB E	BARS						L BA		
DESIGN	1	THICK	NESS	,	A1	BARS			J3	BARS			H1	BARS			H2	BARS		A2	BARS			J4	BARS			Н3	BARS		B1	BARS	B2	2 BARS	,
FILL	TS	BS	ТX	ΤI	SIZE	SPA.	SIZE	SPA.	C1		(2 HT=10	SIZE	SPA.	C5	08	SIZE	SPA.	C6	09	SIZE	SPA.	SIZE	SPA.	C4		.3 HT=10'	SIZE	SPA.	C7	010	SIZE	SPA.	SIZE	SPA.	G1
1 FT	12	9	8	8	5	7.5	5	9	41.1	28.0	32.0	4	16	72.5	54.5	4	16	26.0	27.0	4	8	5	6	60.0	113	125	4	7	58.0	38.0	5	12	5	12	12
2 FT	12	9	8	8	5	7	5	8.5	41.1	28.0	32.0	4	15	72.5	54.5	4	15	25.0	26.0	4	7.5	6	7	63.0	113	125	4	6.5	39.0	38.0	5	12	5	12	12
4 FT	8	9	9	8	4	6	5	6	44.8	24.0	28.0	5	17	75.5	58.0	5	17	23.0	23.0	4	7	5	6	60.8	113	125	4	6	37.0	38.0	5	12	5		12
6 FT	8	9	10	8	4	6.5	5	6.5	59.1	24.0	28.0	5	17	45.0	43.0	5	17	22.0	22.0	4	7	5	6.5	56.3	113	125	5	7.5	34.0	37.0	5	12	5		12
8 FT	8	9	10	8	4	6.5	5	6.5	50.8	28.0	28.0	5	17	38.0	38.0	5	17	22.0	22.0	4	6.5	5	6	51.8	113	125	5	7	33.0	36.0	5	12	5	10.5	
10 FT	8	9	10	8	4	6	6	7.5	50.9	28.0	32.0	5	16	36.0	37.0	5	16	23.0	23.0	5	9	6	6.5	52.6	113	125	5	6	33.0	36.0	5	12	5		0
12 FT	8	10	10	8	4	6	6	6.5	48.5	28.0	32.0	5	15	35.0	36.0	5	15	23.0	24.0	5	8.5	6	7	53.1	114	126	5	6.5	33.0	36.0	5	12	5	9	0
14 FT	9	10	10	8	5	8.5	5	6	46.4	29.0	29.0	5	16	34.0	36.0	5	16	23.0	23.0	5	8	6	7	51.3	114	126	5	6	33.0	36.0	5	12	5	8.5	0
16 FT	9	11	10	8	5	8	5	6	44.8	29.0	29.0	5	15	33.0	35.0	5	15	23.0	24.0	5	7.5	6	7	51.8	115	127	5	6	33.0	36.0	5	12	5	8	0
18 FT	10	12	10	8	5	8	5	6.5	45.3	30.0	30.0	5	15	33.0	35.0	5	15	22.0	23.0	5	7.5	6	7	51.8	116	128	5	6.5	33.0	36.0	5	12	5	8	0
20 FT	11	12	10	8	5	7.5	5	6	46.1	31.0	31.0	5	14	33.0	35.0	5	14	21.0	22.0	5	7	6	6.5	50.8	116	128	5	6	33.0	36.0	5	12	5	8	0
22 FT	11	13	10	8	5	7.5	5	6	45.4	31.0	31.0	5	14	32.0	35.0	5	14	22.0	23.0	5	7	6	6.5	51.4	117	129	5	6	33.0	36.0	5	12	5	8	0
24 FT	12	13	10	8	5	7	5	6	43.4	32.0	32.0	5	13	31.0	35.0	5	13	21.0	22.0	5	6	6	6.5	48.0	117	129	6	8	35.0	39.0	5	12	5	8	0
26 FT	12	14	10	8	5	7	6	7.5	46.1	32.0	36.0	5	13	31.0	35.0	5	13	21.0	22.0	5	6.5	6	7	48.6	118	130	6	8.5	35.0	39.0	5	12	5	8	0
28 FT	13	15	11	8	5	6.5	5	6	43.6	33.0	33.0	5	12	31.0	35.0	5	12	20.0	21.0	5	6.5	5	6.5	45.9	119	131	5	6	32.0	36.0	5	12	5	7.5	0
30 FT	14	15	11	8	5	6.5	5	6	44.3	34.0	34.0	5	12	31.0	35.0	5	12	20.0	21.0	5	6	5	6	45.5	119	131	6	8	35.0	39.0	5	12	5	7.5	0
32 FT	14	16	12	8	5	6.5	5	6	44.1	34.0	34.0	5	12	31.0	34.0	5	12	20.0	21.0	5	6.5	5	6	45.9	120	132	6	8	35.0	40.0	5	12	5	7	0
34 FT	15	17	12	8	5	6.5	5	6	49.6	35.0	35.0	6	17	40.0	43.0	6	17	29.0	30.0	5	6.5	5	6.5	46.5	121	133	6	8	36.0	40.0	5	12	5	7	0
36 FT	15	17	13	8	5	6	5	6	49.6	35.0	35.0	6	16	40.0	43.0	6	16	29.0	30.0	5	6	5	6	46.0	121	133	6	7.5	35.0	40.0	5	12	5	6.5	0
38 FT	16	18	13	8	5	6	6	8.5	54.1	36.0	36.0	6	16	40.0	43.0	6	16	29.0	29.0	5	6	5	6	46.6	122	134	6	8	36.0	40.0	5	12	5	6.5	0
40 FT	16	18	13	8	6	8.5	6	8	54.0	36.0	36.0	6	15	40.0	43.0	6	15	29.0	30.0	5	6	5	6	46.5	122	134	6	7.5	36.0	40.0	5	12	5	6.5	0
42 FT	17	19	14	8	5	6	6	8	54.8	37.0	37.0	6	16	39.0	42.0	6	16	29.0	29.0	5	6	5	6	46.9	123	135	6	7.5	36.0	40.0	5	12	5	6	0
44 FT	17	19	14	8	9	8	6	8	54.6	37.0	37.0	6	15	39.0	42.0	6	15	29.0	29.0	6	8	5	6	46.8	123	135	6	7	36.0	40.0	5	12	5	6	0
46 FT	18	20	14	8	6	8	6	7.5	55.3	38.0	38.0	6	16	39.0	42.0	6	16	28.0	29.0	6	8	5	6	47.3	124	136	6	7.5	36.0	40.0	5	12	5	6	0
48 FT	18	20	15	8	6	7.5	6	8	55.4	38.0	42.0	6	15	39.0	42.0	6	15	28.0	29.0	6	7.5	6	8	50.0	124	136	6	7	36.0	40.0	5	12	6		0
50 FT	18	21	15	8	6	7	6	7.5	55.4	38.0	42.0	6	14	39.0	42.0	6	14	28.0	29.0	6	8	6	8	50.6	125	137	6	7	36.0	40.0	5	12	6	8	0



SPECIAL DESIGNS ARE REQUIRED WHEN THE DESIGN FILL IS LESS THAN 1 FOOT OR GREATER THAN 50 FEET.

DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.

DESIGN FILLS ARE MEASURED FROM THE TOP OF TOP SLAB TO THE TOP OF EARTH FILL OR ROADWAY.

CULVERTS MEET STRENGTH AND SERVICEABILITY REQUIREMENTS FOR THE DESIGN VEHICULAR LIVE LOAD HL-93 MINUS THE LANE LOAD.



MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)



CONCRETE TRIPLE BOX CULVERT

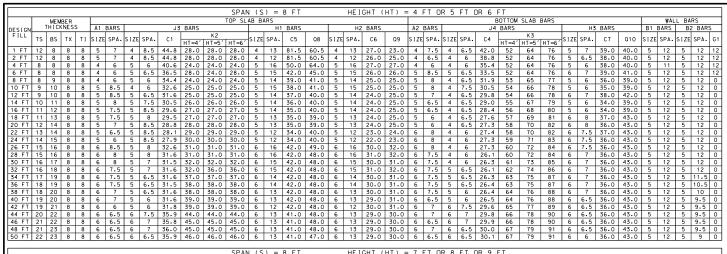
MEMBER THICKNESS BAR SIZE, SPACING & DIMENSIONS

SPAN (S): 7 FEET HEIGHT (HT): 9 THRU 10 FEET

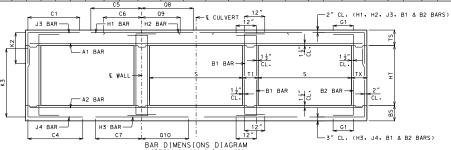
DATE EFFECTIVE: DATE PREPARED: 9/29/2011

703.87

SHEET NO. 9 OF 27



FILE Fractal Fractal) =	8 1			HEI	GHI (HI) =	= (FI U	к в	FIL	JR 9 I	FI											!
Filth TS BS TX TI SIZE FAL S													TOP SL	AB B	ARS											E	OTTOM	SLAB I	BARS						WAL	_L BA	RS	
FILE Fractal Fractal	DESIGN	1	THICK	NESS		A1 B	BARS			J3	BARS				H1	BARS			H2	BARS		A2	BARS			J4	BARS				Н3	BARS		B1	BARS	B:	2 BAR	ŝ
2 FT 12 9 9 8 8 8 5 7 7 4 6 6 44.8 28.0 28.0 4 1 12 81.5 60.5 4 12 2 66.0 24.0 4 6.5 5 6.5 61.3 89 101 113 5 7.5 59.0 41.0 5 12 5 12 12 12 6 FT 8 8 9 8 8 4 6 6 6 7.5 47.8 28.0 32.0 5 16 83.5 64.0 5 16 27.0 28.0 5 8.5 6 6 55.0 88 100 112 5 6 38.0 40.0 5 12 5 12 12 12 6 FT 8 8 9 8 8 4 6 6 6 7.5 47.8 28.0 32.0 5 14 40.0 42.0 5 14 25.0 25.0 5 7.5 6 6 6 84.1 89 101 113 5 6.5 37.0 40.0 5 12 5 12 12 12 12 12 12 12 12 12 12 12 12 12	FILL	TS	BS	тх	TI	SIZE	SPA.	SIZE	SPA.	C1	HT=7'		HT=9'	SIZE	SPA.	C5	08	SIZE	SPA.	C6	09	SIZE	SPA.	SIZE	SPA.	C4	HT=7'		HT=9'	SIZE	SPA.	C7	010	SIZE	Ē SPA.	SIZE	SPA.	G1
4 FT 8 8 8 8 8 8 4 6 6 7.5 47.8 28.0 32.0 5 16 27.0 28.0 5 8.5 6 6 55.0 88 100 112 5 6 33.0 40.0 5 12 5 12 13 3 3 3 3 2 5 15 44.0 25.0 5 14 25.0 25.0 5 7.5 6 6 48.1 89 10 113 5 6 35.0 39.0 5 12 5 11.5 10 11 8 8 8 5 8.5 6 7 44.3 25.0 35.0 39.0 5 12 5 11.5 10	1 FT	12	9	8	8	5	7	4	6	44.8	28.0	28.0	28.0	4	13	81.5	60.5	4	13	27.0	25.0	4	7.5	4	6	66.0	89	101	113	5	8	41.0	41.0	5	12	5	12	12
6 FT 8 8 9 8 8 8 4 4 6 6 6 7.5 \$2.5 \$2.4 \$2.0 \$2.0 \$2.0 \$5 15 \$44.0 \$47.0 \$5 15 \$2.5 \$2.5 \$4.0 \$2.0 \$5 15 \$44.0 \$47.0 \$5 15 \$2.5 \$45.0 \$5.0 \$5 8.5 \$6 6.5 \$2.3 \$89 101 113 \$5 6.5 \$37.0 \$40.0 \$5 112 \$5 112 \$5 115 10 \$10 \$10 \$13 \$5 6.5 \$37.0 \$40.0 \$5 12 \$5 115 10 \$10 \$10 \$15 \$15 \$2.0 \$2.0 \$10 \$10 \$15 \$15 \$2.0 \$2.0 \$10 \$10 \$10 \$10 \$10 \$10 \$10 \$10 \$10 \$1	2 FT	12	9	8	8	5	7	4	6	44.8	28.0	28.0	28.0	4	12	81.5	60.5	4	12	26.0	24.0	4	6.5	5	6.5	61.3	89	101	113	5	7.5	39.0	41.0	5	12	5	12	12
8 FT 8 9 8 8 8 4 6 6 6 7 5 47 4 24 0 28 0 32 0 5 14 40 0 42 0 5 0 5 14 2 5 0 25 0 5 0 5 7 5 6 6 6 48 1 89 101 113 5 6 6 35 0 36 0 30 0 5 12 5 11.5 0 11 5 0 12 5 11.5 0 12 FT 9 10 8 8 5 8 5 6 5 6 7 46 8 25 0 29 0 3 3 0 3 25 0 5 1 4 37 0 40 0 5 1 5 39 0 5 1 2 5 1 1 1 1 1 3 1 1 1 1 1 1 1 1 1 1 1 1 1	4 FT	8	8	8	8	4	6	6	7.5	47.8	28.0	32.0	32.0	5	16	83.5	64.0	5	16	27.0	28.0	5	8.5	6	6	55.0	88	100	112	5	6	38.0	40.0	5	12	5	12	12
10 FT 9 10 8 8 5 8.5 6 7 46.3 25.0 29.0 33.0 5 15 39.0 41.0 5 15 25.0 25.0 5 6.5 6 6 45.9 90 102 114 5 6 35.0 39.0 5 12 5 10 01 12 FT 9 10 11 8 8 5 8.5 6 7 44.8 29.0 33.0 33.0 5 14 37.0 40.0 5 14 24.0 25.0 5 6.5 6 6 44.9 91 103 115 5 6 35.0 39.0 5 12 5 10 01 14 FT 10 11 8 8 8 5 8.5 6 6 6 6 5 44.1 30.0 30.0 34.0 5 14 37.0 40.0 5 14 24.0 25.0 5 6.5 6 6 44.9 91 103 115 5 6 35.0 39.0 5 12 5 9.5 0 16 FT 11 12 8 8 5 7.5 6 6 6 42.4 32.0 32.0 36.0 5 13 35.0 5 14 37.0 40.0 5 14 24.0 25.0 5 6.5 6 6 44.9 91 103 115 5 6 35.0 39.0 5 12 5 9.5 0 16 FT 11 13 8 8 5 7.5 6 6 6 42.4 32.0 32.0 36.0 5 13 35.0 5 14 37.0 40.0 5 14 24.0 25.0 5 6.5 6 6 44.9 91 103 115 5 6 35.0 39.0 5 12 5 9.5 0 16 FT 11 13 8 8 5 7.5 6 6 6 42.4 32.0 32.0 36.0 5 13 35.0 39.0 5 13 24.0 25.0 5 6.5 6 6 6 44.9 91 103 115 5 6 35.0 39.0 5 12 5 9.5 0 16 FT 11 13 8 8 5 7.5 6 6 6 42.4 32.0 32.0 36.0 5 13 35.0 39.0 5 13 24.0 25.0 5 6.5 6 6 6 6.5 44.4 92 104 116 5 6 34.0 34.0 34.0 5 12 5 9.5 0 16 FT 11 13 8 8 5 6.5 6 6 42.4 32.0 32.0 36.0 5 13 35.0 39.0 5 13 24.0 25.0 5 6 6 6 6.5 44.4 92 104 116 5 6 34.0 34.0 34.0 5 12 5 9.5 0 16 FT 11 14 15 10 8 5 6 56 56.5 6 6 42.4 32.0 32.0 36.0 5 13 35.0 39.0 5 12 23.0 24.0 6 8 6 6 6.5 43.6 43.0 94 106 118 6 8 37.0 43.0 5 12 5 9.5 0 16 FT 14 15 10 8 5 6 5 6.5 6.5 6.5 6.5 6.5 6.5 6.5 6.5 6	6 FT	8	9	8	8	4	6	6	7.5	52.5	24.0	28.0	32.0	5	15	44.0	47.0	5	15	26.0	26.0	5	8.5	6	6.5	52.3	89	101	113	5	6.5	37.0	40.0	5	12	5	12	12
12 FT 9 9 10 8 8 5 5 8 6 6 6.5 44.1 30.0 30.0 34.0 5 14 37.0 40.0 5 14 24.0 25.0 5 6.5 6 6 6 44.9 91 103 115 5 6 35.0 39.0 5 12 5 95.0 16 FT 11 12 8 8 8 5 7.5 6 6 6.5 44.1 30.0 30.0 34.0 5 14 37.0 40.0 5 14 24.0 25.0 5 6.5 6 6 6 44.9 91 103 115 5 6 35.0 39.0 5 12 5 95.0 16 FT 11 12 8 8 8 5 7.5 6 6 6 42.1 35.0 31.0 35.0 5 14 37.0 40.0 5 14 24.0 25.0 5 6.5 6 6 6.5 44.9 91 103 115 5 6 35.0 39.0 5 12 5 95.0 16 FT 11 12 14 8 8 5 7.5 6 6 6 42.8 31.0 31.0 35.0 5 13 35.0 39.0 5 13 24.0 25.0 5 6.5 6 6 6.5 44.4 92 104 116 5 6 83.0 39.0 5 12 5 9.5 0 12 7 12 14 8 8 8 5 7.5 6 6 6 42.1 35.0 33.0 36.0 5 13 35.0 39.0 5 13 24.0 25.0 5 6 6 6 6.5 44.4 92 104 116 5 6 83.0 39.0 5 12 5 9.5 0 12 14 14 15	8 FT	8	9	8	8	4	6	6	7.5	47.4	24.0	28.0	32.0	5	14	40.0	42.0	5	14	25.0	25.0	5	7.5	6	6	48.1	89	101	113	5	6	36.0	39.0	5	12	5	11.5	0
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	10 FT	9	10	8	8	5	8.5	6	7	46.3	25.0	29.0	33.0	5	15	39.0	41.0	5	15	25.0	25.0	5	7.5	6	6.5	46.9	90	102	114	5	6	35.0	39.0	5	12	5	11	0
16 FT 11 12 8 8 8 5 7.5 6 6 6.5 43.6 31.0 31.0 35.0 5 14 36.0 40.0 5 14 24.0 25.0 5 6.5 6 6.5 44.4 92 104 116 5 6 34.0 39.0 5 12 5 9.5 0 12 0 12 11 13 14 8 8 5 5 7.5 6 6 42.1 32.0 32.0 36.0 5 13 35.0 39.0 5 13 24.0 25.0 5 6 6 6 6.5 43.4 94 106 118 6 8 37.0 43.0 5 12 5 9.5 0 12 11 13 14 8 8 8 5 6 5 6 6 42.1 32.0 32.0 36.0 5 12 35.0 39.0 5 13 24.0 25.0 5 6 6 6 6.5 43.4 94 106 118 6 8 37.0 43.0 5 12 5 9.5 0 12 11 14 15 10 8 5 6 5 6 6 42.1 32.0 32.0 36.0 5 12 35.0 39.0 5 13 24.0 25.0 5 6 6 6 6.5 43.4 94 106 118 6 8 37.0 43.0 5 12 5 9.5 0 12 11 14 15 10 8 5 6 5 6 6 42.1 32.0 32.0 36.0 5 12 35.0 39.0 5 13 24.0 25.0 5 6 6 6 6 6.5 43.4 94 106 118 6 8 37.0 43.0 5 12 5 9.5 0 12 12 12 14 15 10 8 5 6 5 6 6 42.1 32.0 32.0 36.0 5 12 35.0 39.0 5 12 22.0 24.0 6 8 6 6 43.0 94 106 118 6 8 37.0 43.0 5 12 5 9.5 0 12 12 12 14 15 10 8 5 6 5 6 6 42.1 32.0 34.0 34.0 5 12 35.0 39.0 5 12 22.0 24.0 6 8 6 6 43.0 94 106 118 6 8 37.0 43.0 5 12 5 9.5 0 12 12 12 14 15 10 8 5 6 5 6 6 42.1 32.0 34.0 34.0 34.0 5 12 35.0 39.0 5 12 22.0 24.0 6 8 5 5 7 40.4 95 107 119 6 7 37.0 43.0 5 12 5 8.0 12 12 12 12 14 15 10 8 5 6 5 6 5 6 5 6 5 6 5 6 5 6 5 6 5 6 5	12 FT	9	10	8	8	5	8.5	6	7	44.8	29.0	33.0	33.0	5	14	37.0	40.0	5	14	24.0	25.0	5	6.5	6	6	45.4	90	102	114	6	7	38.0	42.0	5	12	5	10	0
18 FT 11 13 8 8 8 5 7.5 6 6 6 42.8 31.0 31.0 31.0 35.0 5 13 35.0 39.0 5 13 24.0 25.0 5 6 6 6.5 43.9 93 105 117 6 8 8 37.0 43.0 5 12 5 9.5 0 22 FT 13 14 8 8 8 5 7.6 6 6 42.4 32.0 32.0 36.0 5 13 35.0 39.0 5 13 24.0 25.0 5 6 6 6 43.0 94 106 118 6 7.5 37.0 43.0 5 12 5 9.5 0 22 FT 13 14 8 8 8 5 6.5 6 6 6 42.1 33.0 33.0 37.0 5 12 35.0 39.0 5 13 24.0 25.0 5 6 6 6 43.0 94 106 118 6 7.5 37.0 43.0 5 12 5 9.5 0 22 FT 13 14 15 10 8 5 6 5 6 6 42.1 33.0 33.0 37.0 5 12 35.0 39.0 5 12 22.0 24.0 6 8 6 6 43.0 94 106 118 6 7.5 37.0 43.0 5 12 5 9.5 0 24 FT 14 15 10 8 5 6 5 6 5 6.5 40.0 34.0 34.0 5 12 34.0 39.0 5 12 22.0 24.0 6 8 5 7 40.4 95 107 119 6 7 37.0 43.0 5 12 5 8 0 3 0 10 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	14 FT	10	11	8	8	5	8	6	6.5	44.1	30.0	30.0	34.0	5	14	37.0	40.0	5	14	24.0	25.0	5	6.5	6	6	44.9	91	103	115	5	6	35.0	39.0	5	12	5	9.5	0
20 FT 12 14 8 8 8 5 7 6 6 6 42.4 32.0 32.0 32.0 35.0 5 13 55.0 39.0 5 13 24.0 25.0 5 6 6 6.5 43.4 94 106 118 6 8 37.0 43.0 5 12 5 9.5 0 24 FT 14 18 15 10 8 5 6 5 6 6 6 42.4 32.0 34.0 34.0 34.0 5 12 5 30.0 5 12 23.0 24.0 6 8 6 6 43.0 94 106 118 6 7.5 37.0 43.0 5 12 5 9.5 0 24 FT 14 15 10 8 5 6 5 6 5 6 5 6 5 40.0 34.0 34.0 34.0 5 12 34.0 39.0 5 12 23.0 24.0 6 8 6 6 8 43.0 94 106 118 6 7.5 37.0 43.0 5 12 5 8 0 24 FT 14 16 10 8 5 6 5 6 5 6 5 6 5 8.5 39.8 34.0 34.0 5 12 34.0 39.0 5 12 22.0 23.0 6 8.5 5 7 40.4 95 107 119 6 7 37.0 43.0 5 12 5 8 0 4 10 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	16 FT	11	12	8	8	5	7.5	6	6.5	43.6	31.0	31.0	35.0	5	14	36.0	40.0	5	14	24.0	25.0	5	6.5	6	6.5	44.4	92	104	116	5	6	34.0	39.0	5	12	5	9.5	0
22 FT 13 14 8 8 8 5 6.5 6 6 6 42.1 33.0 33.0 37.0 5 12 35.0 33.0 33.0 37.0 5 12 35.0 33.0 5 12 22.0 23.0 6 8.5 5 7 40.4 95 107 119 6 7.5 37.0 43.0 5 12 5 8 0 4 1 16 17 17 17 17 17 17 18 18 6 7.5 18 18 18 18 18 18 18 18 18 18 18 18 18	18 FT	11	13	8	8	5	7.5	6	6	42.8	31.0	31.0	35.0	5	13	35.0	39.0	5	13	24.0	25.0	5	6	6	6.5	43.9	93	105	117	6	8	37.0	43.0	5	12	5	9.5	0
26 FT 14 15 10 8 5 6 5 6.5 45.0 34.0 34.0 34.0 5 12 34.0 39.0 5 12 22.0 23.0 6 8.5 5 7 40.4 95 107 119 6 7 37.0 43.0 5 12 5 8 0 28 FT 15 16 10 8 5 6 5 6.5 43.0 35.0 35.0 35.0 6 16 42.0 48.0 5 12 22.0 24.0 6 8 5 7 40.4 95 107 119 6 7 37.0 43.0 5 12 5 8 0 30 FT 15 16 10 8 6 8 5 6.5 43.0 35.0 35.0 35.0 6 16 42.0 48.0 6 16 30.0 32.0 6 7.5 5 7 38.4 96 108 120 6 7 37.0 43.0 5 12 5 8 0 30 FT 15 17 11 8 6 7.5 5 6.5 43.5 31.0 35.0 35.0 35.0 6 15 42.0 48.0 6 16 30.0 32.0 6 8.5 5 7 38.4 96 108 120 6 7 37.0 43.0 5 12 5 8 0 30 FT 17 19 11 8 6 7.5 5 6.5 43.5 31.0 35.0 35.0 35.0 6 15 42.0 47.0 6 15 31.0 32.0 6 8 5 7 38.8 97 109 121 6 7 37.0 43.0 5 12 5 8.5 32 FT 16 18 11 8 6 7.5 5 6 43.9 33.0 37.0 37.0 6 15 42.0 47.0 6 15 30.0 32.0 6 8 5 7 39.0 98 110 122 6 7 37.0 43.0 5 12 5 8.5 34.0 10 11 18 18 18 18 8 6 7.5 5 6 43.9 33.0 37.0 37.0 6 14 42.0 47.0 6 15 30.0 32.0 6 8 5 7 39.0 98 110 122 6 7 37.0 43.0 5 12 5 8.5 34.0 10 12 12 12 12 12 12 12 12 12 12 12 12 12	20 FT	12	14	8	8	5	7	6	6	42.4	32.0	32.0	36.0	5	13	35.0	39.0	5	13	24.0	25.0	5	6	6	6.5	43.4	94	106	118	6	8	37.0	43.0	5	12	5	9.5	0
26 FT 14 16 10 8 5 6 5 6 39.8 34.0 34.0 5 12 34.0 39.0 5 12 22.0 24.0 6 8 5 7 40.4 96 108 120 6 7.5 37.0 43.0 5 12 5 8 0 30.0 37.	22 FT	13	14	8	8	5	6.5	6	6	42.1	33.0	33.0	37.0	5	12	35.0	39.0	5	12	23.0	24.0	6	8	6	6	43.0	94	106	118	6	7.5	37.0	43.0	5	12	5	9	0
28 FT 15 16 10 8 6 8 5 6.5 43.0 35.0 35.0 5.0 5.0 6 16 42.0 48.0 6 16 30.0 32.0 6 7.5 5 7 38.4 96 108 120 6 7 37.0 43.0 5 12 5 8 0 30 71 71 71 71 71 71 71 7	24 FT	14	15	10	8	5	6	5	6.5	40.0	34.0	34.0	34.0	5	12	34.0		5	12	22.0	23.0	6	8.5	5	7	40.4	95	107	119	6	7		43.0	5	12	5	8	0
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	26 FT	14	16	10	8	5	6	5	6	39.8	34.0	34.0	34.0	5	12	34.0	39.0	5	12	22.0	24.0	6	8	5	7	40.4	96	108	120	6	7.5	37.0	43.0	5	12	5	8	0
32 FT 16 18 11 8 6 8 5 6 6 43.8 32.0 36.0 36.0 6 15 42.0 47.0 6 15 30.0 32.0 6 8 5 7 39.0 98 110 122 6 7 37.0 43.0 5 12 5 8 0 34 FT 17 19 11 8 6 7 5 6 44.4 33.0 37.0 37.0 6 14 42.0 47.0 6 14 30.0 31.0 6 8 5 7 39.0 98 110 122 6 7 37.0 43.0 5 12 5 7.5 0 1 4 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	28 FT	15	16	10	8	6	8	5	6.5	43.0	35.0	35.0	35.0	6	16	42.0		6	16	30.0	32.0	6	7.5	5	7	38.4	96		120	6	7	37.0	43.0	5	12	5	8	0
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	30 FT	15	17	11	8	6	7.5	5	6.5	43.5	31.0	35.0		6	15	42.0	47.0	6	15	31.0	32.0	6	8	5	7	38.8	97	109	121	6	7	37.0	43.0	5	12	5	8.5	0
36 FT 17 19 12 8 6 7 5 5 6 44.4 33.0 37.0 6 14 42.0 47.0 6 14 30.0 31.0 6 7.5 5 6.5 39.3 99 111 123 6 6.5 37.0 43.0 5 12 5 8 0 40 FT 19 20 12 8 6 7 5 5 6 44.6 38.0 38.0 38.0 6 13 42.0 47.0 6 14 29.0 30.0 6 6.5 5 6.5 39.3 99 111 123 6 6.5 37.0 43.0 5 12 5 7.5 0 45.0 14.0 14.0 14.0 14.0 14.0 14.0 14.0 14	32 FT	16	18	11	8	6	8	5	6	43.8	32.0	36.0		6	15	42.0	47.0	6	15	30.0	32.0	6	8	5	7	39.0	98	110	122	6	7	37.0	43.0	5	12	5	8	0
38 FT 18 20 12 8 6 7.5 5 6 44.6 38.0 38.0 38.0 6 13 42.0 47.0 6 13 29.0 31.0 6 7.5 5 6.5 39.6 100 112 124 6 6.5 37.0 43.0 5 12 5 7.5 0 44.0 FT 19 20 12 8 6 7 5 6 44.6 38.0 38.0 38.0 6 14 42.0 47.0 6 13 29.0 30.0 6 6.5 5 6.5 39.6 100 112 124 6 6.5 37.0 43.0 5 12 5 7.5 0 42.FT 19 21 12 8 6 7 6 7.5 48.8 39.0 39.0 39.0 6 14 42.0 47.0 6 14.2 9.0 30.0 6 6.5 5 6.5 39.6 100 112 124 6 6.5 37.0 43.0 5 12 5 7.5 0 42.FT 19 21 12 8 6 7 6 7.5 48.8 39.0 39.0 39.0 6 13 42.0 47.0 6 13 29.0 30.0 6 7 5 6.5 39.8 101 113 125 6 6.5 37.0 43.0 5 12 5 7 0 44.FT 19 20 22 13 8 6 7 5 6 45.5 40.0 40.0 40.0 6 14 41.0 41.0 45.0 6 13 29.0 30.0 6 7 5 6 40.3 102 114 126 6 6.5 37.0 44.0 5 12 5 7 0 44.FT 19 21 23 13 8 6 6.5 5 6 8 49.6 41.0 41.0 41.0 6 13 41.0 46.0 6 13 29.0 30.0 6 7 5 6 40.3 102 114 126 6 6.5 37.0 44.0 5 12 5 7 5 6.5 10.0 40.0 40.0 6 13 41.0 46.0 6 13 29.0 30.0 6 7 5 6 40.3 102 114 126 6 6 5 37.0 44.0 5 12 5 6.5 10.5 10.0 49.7 49.7 49.7 49.7 49.7 49.7 49.7 49.7	34 FT	17		11		6	7.5	5	6					6				6				6	8		7					6	7					5		0
40 FT 9 20 12 8 6 7 5 6 44.6 39.0 39.0 39.0 6 14 42.0 47.0 6 14 29.0 30.0 6 6.5 5 6.5 39.6 100 112 124 6 6.5 37.0 43.0 5 12 5 7 0 42 FT 19 21 12 8 6 7 5 6 45.5 45.5 48.8 39.0 39.0 39.0 6 13 42.0 47.0 6 13 29.0 30.0 6 7 5 6 40.3 102 114 126 6 6.5 37.0 43.0 5 12 5 7 0 44.0 41.0	36 FT			12	8	6	7	5	6					6				6	14			6	7.5	5	6.5					6				5		5		0
42 FT 9 21 12 8 6 7 6 7.5 48.8 39.0 39.0 99.0 99.0 6 13 42.0 47.0 6 13 29.0 30.0 6 7 5 6.5 99.8 101 113 125 6 6.5 37.0 43.0 5 12 5 7 0 44 FT 20 22 13 8 6 6 7 5 6 45.5 40.0 40.0 40.0 6 14 41.0 46.0 6 14 29.0 30.0 6 7 5 6 40.3 102 114 126 6 6.5 37.0 44.0 5 12 5 7 0 44.0 FT 20 22 13 8 6 6.5 6 8 49.5 40.0 40.0 40.0 6 13 41.0 46.0 6 13 29.0 30.0 6 7 5 6 40.3 102 114 126 6 6.5 37.0 44.0 5 12 5 6.5 0 49.5 40.0 40.0 40.0 40.0 40.0 6 13 41.0 46.0 6 13 29.0 30.0 6 7 5 6 40.5 103 115 127 6 6.5 37.0 44.0 5 12 5 6.5 0 49.5 40.0 40.0 40.0 40.0 40.0 40.0 40.0 40	38 FT			12	8		7.5	5	6					6				6				6		5						6				-		5	7.5	0
44 FT 20 22 13 8 6 6 7 5 6 45.5 40.0 40.0 40.0 6 14 41.0 46.0 6 13 29.0 30.0 6 7 5 6 40.3 102 114 126 6 6.5 37.0 44.0 5 12 5 7 0 46 FT 20 22 13 8 6 6.5 6 8 49.5 40.0 40.0 40.0 6 13 41.0 46.0 6 13 29.0 30.0 6 7 5 6 40.3 102 114 126 6 6.5 37.0 44.0 5 12 5 6.5 0 5 0 5 0 5 0 5 0 5 0 5 0 5 0 5 0 5 0	40 FT				-	-	7		6					6				6				6	6.5							6						5	7	0
46 FT 20 22 13 8 6 6.5 6 8 49.5 40.0 40.0 40.0 6 13 41.0 46.0 6 13 29.0 30.0 6 7 5 6 40.5 102 114 126 6 6 37.0 44.0 5 12 5 6.5 0 6 FT 21 23 13 8 6 6.5 6 8 49.6 41.0 41.0 41.0 6 13 41.0 46.0 6 13 29.0 30.0 6 7 5 6 40.5 103 115 127 6 6.5 37.0 44.0 5 12 5 6.5 0 6 5 6 7 49.6 41.0 41.0 41.0 6 13 41.0 46.0 6 13 29.0 30.0 6 6 5 6 40.5 103 115 127 6 6 37.0 44.0 5 12 5 6.5 0 6 5 6 7 49.6 41.0 41.0 41.0 41.0 41.0 46.0 6 13 29.0 30.0 6 6 5 6 40.5 103 115 127 6 6 37.0 44.0 5 12 5 6.5 0 6 5 6 7 49.6 41.0 41.0 41.0 41.0 41.0 41.0 46.0 6 13 29.0 30.0 6 7 5 6 40.5 103 115 127 6 6 37.0 44.0 5 12 5 6.5 0 6 5 6 7 49.6 41.0 41.0 41.0 41.0 41.0 46.0 6 13 29.0 30.0 6 7 5 6 40.5 103 115 127 6 6 37.0 44.0 5 12 5 6.5 0 6 5 6 7 49.6 41.0 41.0 41.0 41.0 41.0 46.0 6 13 29.0 30.0 6 6 5 6 6 5 6 40.5 103 115 127 6 6 37.0 44.0 5 12 5 6.5 0 6 5 6 7 49.6 41.0 41.0 41.0 41.0 41.0 46.0 6 13 29.0 30.0 6 6 5 6 6 5 6 40.5 103 115 127 6 6 37.0 44.0 5 12 5 6.5 0 6 5 6 7 49.6 41.0 41.0 41.0 41.0 41.0 46.0 6 13 29.0 30.0 6 6 5 6 5 6 40.5 103 115 127 6 6 37.0 44.0 5 12 5 6.5 0 6 5 6 7 49.6 41.0 41.0 41.0 41.0 41.0 46.0 6 13 29.0 30.0 6 6 5 6 5 6 40.5 103 115 127 6 6 6 37.0 44.0 5 12 5 6.5 0 6 5 6 7 49.6 41.0 41.0 41.0 41.0 41.0 41.0 46.0 6 13 29.0 30.0 6 6 5 6 5 6 40.5 103 115 127 6 6 6 37.0 44.0 5 12 5 6.5 0 6 5 6 7 49.6 41.0 41.0 41.0 41.0 41.0 41.0 41.0 41.0	42 FT	19	21	12	8	6	7	6	7.5		39.0	39.0		6	13	42.0		6	13			6	7	5	6.5					6	6.5			5	12	5	7	0
48 FT 21 23 13 8 6 6.5 6 8 49.6 41.0 41.0 41.0 6 13 41.0 46.0 6 13 29.0 30.0 6 7 5 6 40.5 103 115 127 6 6.5 37.0 44.0 5 12 5 6.5 0 5 0 FT 21 23 13 8 6 6.5 6 7 49.6 41.0 41.0 41.0 41.0 6 13 41.0 46.0 6 13 29.0 30.0 6 6 5 6 40.5 103 115 127 6 6 37.0 44.0 5 12 5 6.5 0	44 FT			13	8	-	7	5						6								6	7							6						5	7	0
50 FT 21 23 13 8 6 6.5 6 7 49.6 41.0 41.0 41.0 6 13 41.0 46.0 6 13 29.0 30.0 6 6 5 6 40.5 103 115 127 6 6 6 37.0 44.0 5 12 5 6.5 0	46 FT				-													6	13			6	7		6											5		0
	48 FT								8										13				7	_	6						6.5					5		0
	50 FT	21	23	13	8	6	6.5		7	49.6	41.0	41.0	41.0	6	13	41.0	46.0	6	13	29.0	30.0	6	6	5	6	40.5	103	115	127	6	6	37.0	44.0	5	12	5	6.5	0



THE OFFICE MEMBER THE THE MEMBER THE MEMBER

SPECIAL DESIGNS ARE REQUIRED WHEN THE DESIGN FILL IS LESS THAN 1 FOOT OR GREATER THAN 50 FEET.

DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.

DESIGN FILLS ARE MEASURED FROM THE TOP OF TOP SLAB TO THE TOP OF EARTH FILL OR ROADWAY.

CULVERTS MEET STRENGTH AND SERVICEABILITY REQUIREMENTS FOR THE DESIGN VEHICULAR LIVE LOAD HL-93 MINUS THE LANE LOAD.



MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)



CONCRETE TRIPLE BOX CULVERT

MEMBER THICKNESS BAR SIZE. SPACING & DIMENSIONS

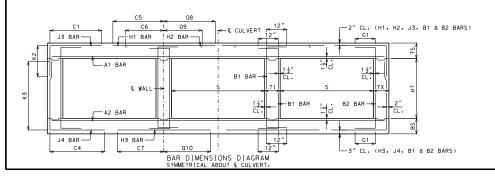
SPAN (S): 8 FEET HEIGHT (HT): 4 THRU 9 FEET

DATE EFFECTIVE: DATE PREPARED: 12/01/2011 9/29/2011 703.87

10 OF 27

SHEET NO.

																																			_
														= 8	FT			HE I GH	IT (HT) =	10	FT (DR 11	1 FT											
		MEM		ļ								TOP :	SLAB												MOTTO	SLAB E	BARS					WAL			
DESIGN		THICK	NESS	,	A1 8	BARS			J3	BARS			H1	BARS			H2	BARS		A2	BARS			J4	BARS			Н3	BARS		B1	BARS	B2	2 BARS	ذ
FILL	TS	BS	ТХ	ΤI	SIZE	SPA.	SIZE	SPA.	C1	HT=10	(2 HT=11	SIZE	SPA.	C5	08	SIZE	SPA.	C6	09	SIZE	SPA.	SIZE	SPA.	C4	K HT=10'		SIZE	SPA.	C7	010	SIZE	SPA.	SIZE	SPA.	G1
1 FT	12	9	8	9	5	7	5	7	44.9	32.0	32.0	4	13	81.5	61.5	4	13	28.0	26.0	4	6.5	6	6	69.3	125	137	5	7.5	43.0	42.0	5	11.5	5	10	12
2 FT	12	9	9	9	5	7	5	8	45.5	32.0	32.0	4	12	82.5	61.5	4	12	27.0	24.0	4	6.5	6	6.5	70.0	125	137	5	7	41.0	41.0	5	11.5	5	10.5	12
4 FT	8	9	10	9	4	6	6	7	49.1	28.0	28.0	5	16	84.5	65.0	5	16	27.0	27.0	4	6	5	6	65.8	125	137	5	7	39.0	41.0	5	11.5	5	9.5	12
6 FT	8	9	11	9	4	6	5	6	57.1	28.0	28.0	5	16	44.0	44.0	5	16	26.0	26.0	5	9	5	6	56.6	125	137	5	6.5	37.0	39.0	5	11.5	5	9.5	12
8 FT	8	10	11	9	4	6	6	7	54.8	28.0	28.0	5	15	41.0	41.0	5	15	25.0	26.0	5	9	5	6.5	56.4	126	138	5	6.5	37.0	39.0	5	12	5	9	0
10 FT	8	10	11	9	4	6	6	6.5	51.9	28.0	28.0	5	14	39.0	40.0	5	14	25.0	25.0	5	7.5	5	6	54.0	126	138	5	6	36.0	39.0	5	12	5	8.5	0
12 FT	9	11	11	9	5	8.5	6	7	52.5	29.0	29.0	5	14	38.0	39.0	5	14	25.0	25.0	5	7.5	5	6	53.9	127	139	5	6	36.0	39.0	5	12	5	8	0
14 FT	10	11	11	9	5	8	5	6	50.1	30.0	30.0	5	15	37.0	39.0	5	15	25.0	25.0	5	7	5	6	51.9	127	139	5	6	35.0	39.0	5	12	5	7.5	0
16 FT	10	12	11	9	5	7.5	5	6	48.3	30.0	30.0	5	13	36.0	39.0	5	13	24.0	25.0	5	6.5	5	6	52.3	128	140	5	6	35.0	39.0	5	12	5	7.5	0
18 FT	11	13	11	9	5	7.5	5	6.5	48.6	31.0	31.0	5	14	36.0	39.0	5	14	24.0	25.0	5	6.5	6	7	55.0	129	141	6	8	38.0	42.0	5	12	5	7.5	0
20 FT	12	14	11	9	5	7	5	6	48.8	32.0	32.0	5	13	35.0	39.0	5	13	24.0	25.0	5	6.5	6	7	54.9	130	142	6	8	38.0	43.0	5	12	5	7.5	0
22 FT	13	15	11	9	5	6.5	6	8	52.1	33.0	37.0	5	12	35.0	39.0	5	12	23.0	24.0	5	6	6	7	54.9	131	143	6	8	38.0	43.0	5	12	5	7.5	0
24 FT	13	15	12	9	5	6.5	5	6	48.3	33.0	33.0	5	12	35.0	38.0	5	12	23.0	25.0	5	6		7.5	53.9	131	143	6	7	38.0	43.0	5	12	5	7	0
26 FT	14	16	12	9	5	6	6	8	51.8	34.0	38.0	5	12	35.0	38.0	5	12	22.0	24.0	5	6	6	7.5	54.1	132	144	6	7.5	38.0	43.0	5	12	5	7	0
28 FT	15	16	12	9	5	6	6	8	56.1	35.0	39.0	6	16	43.0	47.0	6	16	31.0	32.0	6	7.5	6	8	51.0	132	144	6	7	38.0	43.0	5	12	5	7	0
30 FT	15	17	12	9	6	8	6	7	55.9	35.0	39.0	6	16	43.0	47.0	6	16	31.0	32.0	6	8			51.5	133	145	6	7	38.0	43.0	5	12	5	7	0
32 FT	16	18	13	9	6	8	6	8	56.5	36.0	40.0	6	15	42.0	47.0	6	15	30.0	31.0	6	8			51.8	134	146	6	7	38.0	43.0	5	12	5		0
34 FT	17	19	13	9	6	8	6	7.5	56.9	37.0	41.0	6	14	42.0	47.0	6	14	30.0	31.0	6	8	6	8.5	52.3	135	147	6	7	38.0	43.0	5	12	5		0
36 FT	17	19	14	9	6	7.5	6	7.5	57.0	37.0	41.0	6	14	42.0	46.0	6	14	30.0	31.0	6	7.5	6	8	51.9	135	147	6	6.5	38.0	43.0	5	12	5	6	0
38 FT	18	20	14	9	6	7.5	6	7.5	57.4	38.0	42.0	6	14	42.0	46.0	6	14	30.0	31.0	6	7.5	6	8	52.3	136	148	6	7	38.0	43.0	5	12	5	6	0
40 FT	18	20	14	9	6	7	6	6.5	57.3	38.0	42.0	6	13	42.0	46.0	6	13	30.0	31.0	6	6.5	6	8	52.1	136	148	6	6.5	38.0	43.0	5	12	5	6	0
42 FT	19	21	15	9	6	7	6	7	57.9	43.0	43.0	6	14	42.0	46.0	6	14	30.0	30.0	6	7	6	8	52.6	137	149	6	6.5	38.0	43.0	5	12	6	8	0
44 FT	19	22	15	9	6	7	6	7	57.9	43.0	43.0	6	13	42.0	46.0	6	13	30.0	30.0	6	7	6	8	53.0	138	150	6	6.5	38.0	43.0	5	12	6	8	0
46 FT	20	22	15	9	6	7	6	6	58.1	44.0	44.0	6	14	42.0	45.0	6	14	30.0	30.0	6	7		7.5	52.9	138	150	6	6.5	38.0	43.0	5	12	6	8	0
48 FT	20	23	16	9	6	6.5	6	7	58.5	44.0	44.0	6	13	42.0	45.0	6	13	30.0	30.0	6	7	6	7.5	53.3	139	151	6	6.5	38.0	44.0	5	12	6		0
50 FT	21	23	16	9	6	6.5	6	6.5	58.9	45.0	45.0	6	13	42.0	45.0	6	13	29.0	30.0	6	6.5	6	7.5	53.3	139	151	6	6	38.0	44.0	5	12	6	8	0



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MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)



CONCRETE TRIPLE BOX CULVERT

MEMBER THICKNESS BAR SIZE, SPACING & DIMENSIONS

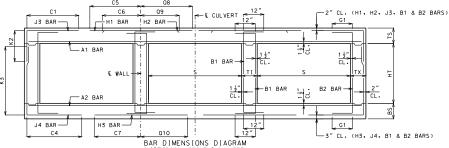
SPAN (S): 8 FEET HEIGHT (HT): 10 THRU 11 FEET

DATE EFFECTIVE: DATE PREPARED: 9/29/2011

703.87

SHEET NO. 11 OF 27

												SPAN			FT			HE I G	HT (F	IT) =	8 F	T OR	9 F	T OF													
		MEME		L								TOP SL	AB B													MOTTO	SLAB	BARS							L BAF		
ESIGN	1	HICK	NESS		A1 (BARS			J.	3 BARS				H1	BARS			H2	BARS		A2 I	BARS			J4	BARS				Н3	BARS		B1	BARS	B2	2 BARS	ŝ
FILL	TS	BS	тх	TIS	IZE	SPA.	SIZE	SPA.	C1	HT=8'	K2 HT=9'	HT=10	SIZE	SPA.	C5	08	SIZE	SPA.	C6	09	SIZE	SPA.	SIZE	SPA.	C4	HT=8'	K3 HT=9'	HT=10'	SIZE	SPA.	C7	010	SIZE	SPA.	SIZE	SPA.	G1
1 FT	13	9	8	8	5	6.5	5	8.5	48.3	29.0	29.0	33.0	4	12	89.5	66.5	4	12	29.0	27.0	4	6.5	6	6.5	75.0	101	113	125	5	7	43.0	44.0	5	12	5	12	12
2 FT	13	9	8	8	5	6.5	5	8.5	51.3	29.0	33.0	33.0	5	18	91.5	68.5	5	18	28.0	25.0	5	9	6	6.5	69.0	101	113	125	5	6.5	42.0	44.0	5	12	5	11.5	12
4 FT	9	9	8	8	5	8.5	6	7	51.3	29.0	33.0	33.0	5	16	91.5	70.0	5	16	29.0	30.0	5	8	6	6	62.0	101	113	125	5	6	41.0	44.0	5	12	5	10	1:
6 FT	9	10	9	8	5	8.5	5	6	54.9	25.0	25.0	29.0	5	15	49.0	53.0	5	15	27.0	28.0	5	8	5	6	53.9	102	114	126	5	6.5	39.0	43.0	5	12	5	11	1
8 FT	9	10	9	8	5	8.5	5	6	48.8	25.0	29.0	29.0	5	14	44.0	46.0	5	14	26.0	27.0	5	7	6	6.5	52.4	102	114	126	6	7	41.0	46.0	5	12	5	10.5	Г
0 FT	9	11	9	8	5	8.5	5	6	46.5	25.0	29.0	29.0	5	12	42.0	44.0	5	12	26.0	26.0	5	6.5	6	7	51.4	103	115	127	5	6	38.0	43.0	5	12	5	9.5	Г
2 FT	10	11	9	8	5	8	5	6	45.8	30.0	30.0	30.0	5	13	40.0	43.0	5	13	26.0	27.0	5	6.5	6	6	49.5	103	115	127	6	7	40.0	45.0	5	12	5	9	Γ
4 FT	11	12	9	8	5	7.5	6	7	48.1		31.0	35.0	5	13	39.0	43.0	5	13	25.0	27.0	5	6	6	6.5	48.8	104	116	128	6	7	40.0	46.0	5	12	5	8.5	Ε
6 FT	12	13	9	8	5	7	6	6.5	47.4	32.0		36.0	5	13	39.0	43.0	5	13	25.0	27.0	5	6	6	6.5	48.3	105	117	129	6	7	40.0	46.0	5	12		8.5	Ē
8 FT	13	14	9	8	5	6.5	6	7	46.9	33.0		37.0	5	12	38.0	43.0	5	12	24.0	26.0	6	8	6	6.5	47.6	106	118	130	6	7.5	40.0	46.0	5	12		8.5	Ĺ
O FT	13	15	9	8	5	6.5	6	6	46.0	33.0		37.0	5	12	38.0	43.0	5	12	25.0	27.0	6	8	6	6.5	47.1	107	119	131	6	7	40.0	46.0	5	12	5	8.5	Ĺ
2 FT	14	16	11	8	5	6	5	6	43.5			34.0	5	12	37.0	42.0	5	12	25.0	26.0	6	7.5	5	7	44.0	108	120	132	6	7	40.0	46.0	5	12	5	8	Ĺ
4 FT	15	17	11	8	6	8	5	6	48.4	35.0		35.0	6	16	46.0	51.0	6	16	33.0	35.0	6	7.5	5	7	44.0	109	121	133	6	6.5	40.0	46.0	5	12		7.5	Ĺ
6 FT	16	17	11	8	6	8	6	8	52.1	36.0		36.0	6	15	45.0	51.0	6	15	32.0	34.0	6	6.5	5	6	43.6	109	121	133	6	6.5	40.0	46.0	5	12	5	7.5	Ĺ
8 FT	17	18	12	8	6	7.5	5	6	48.8	37.0		37.0	6	14	45.0	51.0	6	14	31.0	33.0	6	7		6.5	43.9	110	122	134	6	6.5	40.0	46.0	5	12	5	7	L
50 FT	17	19	12	8	6	7.5	5	6	46.9	37.0			6	14	44.0	51.0	6	14	32.0	33.0	6	7		6.5	42.0	111	123	135	6	6	40.0	47.0	5	12	5	7.5	L
2 FT	18	20	12	8	6	7	6	8	51.0	38.0		38.0	6	13	44.0	50.0	6	13	31.0	33.0	6	7		6.5	42.3	112	124	136	6	6	40.0	47.0	5	12	5	7	L
54 FT	19	20	12	8	6	7	6	8	50.9	39.0			6	13	44.0	50.0	6	13	30.0	32.0	6	6	_	6.5	42.3	112	124	136	6	6	40.0	47.0	5	12	5	7	L
56 FT	19	21	13	8	6	6.5	6	8	51.6	39.0		39.0	6	13	44.0	50.0	6	13	31.0	32.0	6	6.5	5	6	42.5	113	125	137	6	6	40.0	47.0	5	12	5	7	L
38 FT	20	22	13	8	6	6.5	6	7.5	51.8	40.0		40.0	6	12	44.0	50.0	6	12	30.0	31.0	6	6.5	5	6	42.8	114	126	138	6	6	40.0	47.0	5	12		6.5	L
10 FT	21	23	13	8	6	6.5	6	7.5	51.9	41.0		41.0	6	12	44.0	49.0	6	12	30.0	31.0	6	6.5	5	6	43.0	115	127	139	6	6	40.0	47.0	5	12		6.5	L
12 FT	21		14	8	6	6	6	7.5	52.6	41.0			6	12	44.0	49.0	6	12	30.0	31.0	6	6.5	5	6	43.4	116	128	140	6	6	40.0	47.0	5	12		6.5	L
14 FT	22		14	8	6	6	6	7.5	52.6	42.0			6	12	44.0	49.0	6	12	30.0	31.0	6	6	5	6	43.4	116	128	140	7	7.5	43.0	50.0	5	12	5	6	L
	23		14	8	6	6	6	7	52.8	43.0			6	12	43.0	48.0	6	12	30.0	31.0	6	6	5	6	43.6	117	129	141	7	7.5	43.0	50.0	5	12	5	6	L
	23		15	8	6	6	6	1 7	53.6	43.0			6	12	44.0	48.0	6	12	30.0	31.0	6	6	6	- 8	47.0	118	130	142	7	7.5	43.0	50.0	5	12	5	6	L
50 FT	24	26	15	8	6	6	6 C5	1 7	53.6	44.0 Q8	44.0	48.0	6	12	43.0	48.0	6	12	30.0	30.0	6	6	6	8	47.1	118	130	142	7	7.5	43.0	50.0	5	12	6	8	إل



THE DESIGN FILLS BETWEEN TABLLATED DESIGN FILLS. USE THE NET I THE DESIGN FILL TO BE SEN FILLS THE THE DESIGN FILES THE NET A FEET FILE ADDUCTOR TO SEN FILLS FILES FILES FILES AND A FEET USE THE GREATER BETWEEN 2 FEET AND A FEET TABLLATED DESIGN FILLS. THE GREATER BETWEEN THE SEN FILES FILES FILES FILES FILES DIMENSIONS FROM THE 2 FEET AND A FEET TABLLATED DESIGN FILLS. AREA OF REINFORCEMENT EQUALS BAR AREA PER FOOT SPACING

SPECIAL DESIGNS ARE REQUIRED WHEN THE DESIGN FILL IS LESS THAN 1 FOOT OR GREATER THAN 50 FEET.

DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.

DESIGN FILLS ARE MEASURED FROM THE TOP OF TOP SLAB TO THE TOP OF EARTH FILL OR ROADWAY.

CULVERTS MEET STRENGTH AND SERVICEABILITY REQUIREMENTS FOR THE DESIGN VEHICULAR LIVE LOAD HL-93 MINUS THE LANE LOAD.



MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

105 WEST CAPITOL

JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)



CONCRETE TRIPLE BOX CULVERT

MEMBER THICKNESS BAR SIZE. SPACING & DIMENSIONS

SPAN (S): 9 FEET HEIGHT (HT): 5 THRU 10 FEET

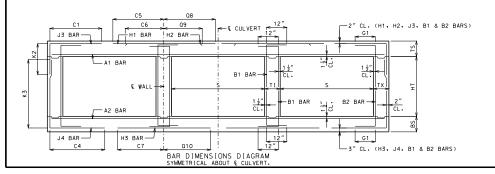
DATE EFFECTIVE: DATE PREPARED:

9/29/2011

703.87

SHEET NO. 12 OF 27

												SPAN	(5)	= 9	FT			HE I GH	IT (HI) =	11	FT (OR 12	? FT										
		MEM										TOP :	SLAB												MOTTO	SLAB E	BARS						L BA	
DESIGN		THIC	NESS	,	A1	BARS			J3	BARS			H1	BARS			H2	BARS		A2	BARS			J4	BARS			Н3	BARS		B1	BARS	B2	BARS
FILL	TS	вѕ	тх	ΤI	SIZE	SPA.	SIZE	SPA.	C1	HT=11	(2 HT=12	SIZE	SPA.	C5	08	SIZE	SPA.	C6	09	SIZE	SPA.	SIZE	SPA.	C4	HT=11'		SIZE	SPA.	C7	010	SIZE	SPA.	SIZE	SPA. G
1 FT	13	9	9	10	5	6.5	5	7.5	49.3	33.0		4	12	90.5	67.5	4	12	29.0	27.0	4	6	6	6	76.3	137	149	5	6.5	44.0	44.0	5	10	5	9 12
2 FT	13	10	9	10	5	6.5	5	7	52.3	33.0	33.0	5	18	92.5	69.5	5	18	28.0	25.0	4	6	6	6.5	76.3	138	150	5	7	44.0	45.0	5	11.5	5	9 12
4 FT	9	10	9	10	5	8.5	5	6	52.3	29.0	29.0	5	16	92.5	71.0	5	16	29.0	30.0	5	8.5	6	6	76.3	138	150	5	7	43.0	45.0	5	11.5	5	8.5 12
6 FT	9	10	10	10	5	8.5	5	6	69.4	29.0	29.0	5	16	51.0	49.0	5	16	28.0	28.0	5	7.5	6	6.5	68.8	138	150	5	6	41.0	43.0	5	12	5	8 12
8 FT	9	10	10	10	5	8.5	5	6	60.0	29.0	29.0	5	14	45.0	45.0	5	14	27.0	27.0	5	7	6	6	63.9	138	150	6	7	43.0	45.0	5	12	5	8 0
10 FT	9	11	10	10	5	8.5	6	7	59.0	29.0	33.0	5	13	42.0	43.0	5	13	27.0	27.0	5	6.5	6	6	63.6	139	151	5	6	39.0	43.0	5	12	5	8 0
12 FT	10	12	10	10	5	8	6	7	58.6	30.0	34.0	5	13	41.0	43.0	5	13	26.0	27.0	5	6.5	6	6.5	62.8	140	152	5	6	39.0	43.0	5	12	5	8 0
14 FT	11	12	10	10	5	7.5	6	7.5	58.5	31.0	35.0	5	13	41.0	43.0	5	13	26.0	27.0	5	6	6	6	60.4	140	152	6	7	41.0	45.0	5	12	5	8 0
16 FT	12	13	11	10	5	7	5	6	54.4	32.0	32.0	5	13	40.0	42.0	5	13	26.0	27.0	5	6	6	7	59.1	141	153	6	7	41.0	45.0	5	12	5	7.5 0
18 FT	12	14	11	10	5	7	6	7.5	55.6	32.0	36.0	5	12	39.0	42.0	5	12	26.0	27.0	6	8	6	6.5	59.0	142	154	6	7.5	41.0	46.0	5	12	5	7.5 0
20 FT	13	15	12	10	5	6.5	6	8	55.0	33.0	37.0	5	12	38.0	42.0	5	12	26.0	27.0	6	8	6	7	58.1	143	155	6	7	41.0	46.0	5	12	5	7 0
22 FT	14	16	12	10	5	6	6	7.5	55.0	34.0	38.0	5	12	38.0	42.0	5	12	25.0	27.0	6	7.5	6	7	57.9	144	156	6	7	41.0	46.0	5	12	5	7 0
24 FT	15	17	13	10	6	8	6	7.5	61.0	35.0	39.0	6	16	47.0	51.0	6	16	33.0	35.0	6	7.5	6	7.5	57.4	145	157	6	6.5	41.0	46.0	5	12	5	6.5 0
26 FT	16	17	13	10	6	8	6	7	61.3	40.0	40.0	6	15	46.0	51.0	6	15	33.0	34.0	6	6.5	6	7	56.6	145	157	6	6.5	41.0	46.0	5	12	5	6.5 0
28 FT	16	18	14	10	6	8	6	7.5	61.0	36.0	40.0	6	15	46.0	51.0	6	15	33.0	35.0	6	7	6	7	56.6	146	158	6	6.5	41.0	46.0	5	12	5	6 0
30 FT	17	19	14	10	6	7.5	6	7.5	59.6	37.0	41.0	6	14	45.0	50.0	6	14	32.0	34.0	6	7	6	7.5	54.8	147	159	6	6	41.0	46.0	5	12	5	6 0
32 FT	18	20	14	10	6	7	6	7	59.9	38.0	42.0	6	13	45.0	50.0	6	13	32.0	33.0	6	7		7.5	55.0	148	160	6	6	41.0	46.0	5	12	5	6 0
34 FT	18	20	14	10	6	6.5	6	6.5	59.8	38.0	42.0	6	13	45.0	50.0	6	13	32.0	34.0	6	6	6	7.5	54.9	148	160	6	6	41.0	46.0	5	12	5	6 0
36 FT	19	21	15	10	6	6.5	6	7	60.3	43.0	43.0	6	13	45.0	50.0	6	13	31.0	33.0	6	6.5	6	7.5	55.3	149	161	6	6	41.0	47.0	5	12	6	8 0
38 FT	20	22	15	10	6	6.5	6	6.5	60.6	44.0	44.0	6	12	45.0	50.0	6	12	31.0	32.0	6	6.5	6	7.5	55.5	150	162	6	6	41.0	47.0	5	12	6	8 0
40 FT	20	23	16	10	6	6.5	6	6.5	60.9	44.0	44.0	6	12	45.0	49.0	6	12	31.0	32.0	6	6.5	6	7.5	55.9	151	163	6	6	41.0	47.0	5	12	6	8 0
42 FT	21	23	16	10	6	6.5	6	6.5	61.1	45.0	45.0	6	12	45.0	49.0	6	12	31.0	32.0	6	6	6	7.5	55.8	151	163	7	7.5	44.0	50.0	5	12	6	8 0
44 FT	22	24	17	10	6	6	6	6.5	61.9	46.0	46.0	6	12	45.0	49.0	6	12	31.0	32.0	6	6	6	7	56.3	152	164	7	7.5	44.0	50.0	5	12	6	7.5 0
46 FT	22	25	17	10	6	6	6	6	61.9	46.0	46.0	6	12	45.0	48.0	6	12	31.0	32.0	6	6	6	7	56.5	153	165	7	8	44.0	50.0	5	12	6	7.5 0
48 FT	23	26	18	10	6	6	6	6.5	62.5	47.0	47.0	6	12	44.0	48.0	6	12	31.0	31.0	6	6	6	6.5	57.0	154	166	7	8	44.0	50.0	5	12	6	7 0
50 FT	23	26	18	10	7	8	6	6	62.5	47.0	47.0	6	12	44.0	48.0	6	12	31.0	31.0	6	6	6	6.5	56.9	154	166	7	7.5	44.0	50.0	5	12	6	7 0



SPECIAL DESIGNS ARE REQUIRED WHEN THE DESIGN FILL IS LESS THAN 1 FOOT OR GREATER THAN 50 FEET.

DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.

DESIGN FILLS ARE MEASURED FROM THE TOP OF TOP SLAB TO THE TOP OF EARTH FILL OR ROADWAY.

CULVERTS MEET STRENGTH AND SERVICEABILITY REQUIREMENTS FOR THE DESIGN VEHICULAR LIVE LOAD HL-93 MINUS THE LANE LOAD.



MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)



CONCRETE TRIPLE BOX CULVERT

MEMBER THICKNESS BAR SIZE, SPACING & DIMENSIONS

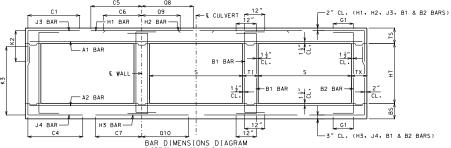
SPAN (S): 9 FEET HEIGHT (HT): 11 THRU 12 FEET

DATE EFFECTIVE: DATE PREPARED: 9/29/2011

703.87

SHEET NO. 13 OF 27

													(S)		O FT			HE I	GHT (HT) =	= 8	FT O	₹ 9	FT (
		MEME	BER									TOP SL	AB B													MOTTO	SLAB I	BARS							L BAI		
DESIGN		THICK	NESS	•	Α1	BARS			J:	BARS				H1	BARS			H2	BARS		A2	BARS			J4	BARS				Н3	BARS		B1 /	BARS	B2	2 BARS	_]
FILL	TS	BS	ТХ	ΤI	SIZE	SPA.	SIZE	SPA.	C1	HT=8'	K2 HT=9'	HT=10	SIZE	SPA.	C5	08	SIZE	SPA.	C6	09	SIZE	SPA.	SIZE	SPA.	C4	HT=8'	K3 HT=9'	HT=10'	SIZE	SPA.	C7	010	SIZE	SPA.	SIZE	SPA. C	31
1 FT	13	9	8	8	5	6.5	5	8.5	54.9	29.0	33.0	33.0	5	16	100.5	74.5	5	16	30.0	30.0	5	8.5	6	6.5	74.1	101	113	125	5	6	46.0	47.0	5	12	5	12 1	12
2 FT	13	9	8	8	5	6.5	5	8	54.9	29.0	33.0	33.0	5	14	100.5	74.5	5	14	28.0	28.0	5	7.5	6	6	65.8	101	113	125	6	7	47.0	50.0	5	12		11.5 1	
4 FT	9	9	9	8	5	7	5	6	65.9	29.0	29.0	29.0	5	13	74.0	76.0	5	13	30.0	31.0	5	7.5	6	6.5	57.6	101	113	125	6	6.5	46.0	50.0	5	12		11.5 1	12
6 FT	9	9	9	8	5	8	5	6	51.8	29.0	29.0	29.0	5	13	51.0	57.0	5	13	29.0	29.0	5	7	6	6	52.9	101	113	125	6	6	45.0	48.0	5	12		11.5 1	12
8 FT	9	10	9	8	5	8	5	6	48.1	29.0	29.0	29.0	6	15	49.0	52.0	6	15	30.0	31.0	5	7	6	6.5	51.0	102	114	126	6	6	44.0	49.0	5	12	5	11 (0
10 FT	10	11	9	8	5	8	5	6	46.5	30.0	30.0		5	12	44.0	48.0	5	12	27.0	28.0	5	6.5	6	6.5	49.5	103	115	127	6	6.5	43.0	49.0	5	12	5	10.5	0
12 FT	11	12	9	8	5	7.5	6	7	48.1	31.0	31.0	35.0	6	16	45.0	50.0	6	16	30.0	31.0	5	6	6	6.5	48.4	104	116	128	6	6.5	43.0	49.0	5	12	5	9.5	0
14 FT	12	13	9	8	5	7	6	7	47.0	32.0			6	16	45.0	50.0	6	16	29.0	31.0	5	6	6	7	47.4	105	117	129	6	6.5	42.0	49.0	5	12	5	8.5	0
16 FT	13	14	9	8	5	6.5	6	7	46.0	33.0			6	16	44.0	50.0	6	16	29.0	31.0	6	8	6	7	46.5	106	118	130	6	7	42.0	49.0	5	12	5	8.5	0
18 FT	14	15	9	8	5	6	6	7	45.3	34.0			6	16	43.0	49.0	6	16	29.0	31.0	6	7.5	6	7	45.9	107	119	131	6	7	42.0	49.0	5	12	5	8.5	0
20 FT	15	16	9	8	6	8	6	7	50.5	35.0	35.0	39.0	6	16	49.0	55.0	6	16	35.0	37.0	6	7	6	6.5	45.3	108	120	132	6	7	42.0	49.0	5	12	5	8.5	0
22 FT	15	17	11	8	6	7.5	5	6	47.1	35.0	35.0	35.0	6	15	48.0	55.0	6	15	35.0	37.0	6	7	5	7	42.1	109	121	133	6	6.5	42.0	50.0	5	12	5		0
24 FT	17	18	11	8	6	7.5	6	8.5	50.8	37.0			6	14	48.0	55.0	6	14	33.0	36.0	6	6.5	5	6.5	42.0	110	122	134	6	6.5	42.0	50.0	5	12	5		0
26 FT	18	19	11	8	6	7	6	8	50.4	38.0	38.0		6	13	47.0	55.0	6	13	33.0	35.0	6	6.5	5	6	41.8	111	123	135	6	6	42.0	50.0	5	12	5		0
28 FT	18	20	12	8	6	7	6	8	51.0	38.0	38.0	38.0	6	13	47.0	54.0	6	13	34.0	36.0	6	6.5	5	6.5	41.9	112	124	136	6	6	42.0	50.0	5	12	5		0
30 FT	19	21	12	8	6	6.5		7.5	50.9	39.0			6	13	47.0	54.0	6	13	33.0	35.0	6	6.5	5	6.5	41.9	113	125	137	7	7.5	45.0	53.0	5	12	5		0
32 FT	20	22	12	8	6	6.5	6	7	50.9	40.0	40.0	40.0	6	12	47.0	54.0	6	12	32.0	34.0	6	6	5	6.5	42.0	114	126	138	7	7.5	45.0	53.0	5	12	5	7 .	0
34 FT	21	23	12	8	6	6	6	7.5	49.6	41.0	41.0	41.0	6	12	46.0	53.0	6	12	31.0	33.0	6	6	5	6.5	40.8	115	127	139	7	7.5	45.0	53.0	5	12	5	7	0
36 FT	22	24	12	8	6	6	6	7	49.8	42.0	42.0	42.0	7	15	51.0	58.0	7	15	36.0	37.0	6	6	5	6.5	40.9	116	128	140	7	7.5	45.0	53.0	5	12	5	7	0
38 FT	22	24	13	8	6	6	6	7.5	50.4	42.0	42.0	42.0	7	15	51.0	58.0	7	15	36.0	38.0	6	6	5	6	41.1	116	128	140	7	7	45.0	53.0	5	12	5	6.5	0
40 FT	23	25	13	8	7	7.5	6	7.5	50.4	43.0	43.0	43.0	7	15	51.0	58.0	7	15	36.0	37.0	6	6	5	6	41.4	117	129	141	7	7	45.0	53.0	5	12	5	6.5	0
42 FT	24	26	13	8	7	7.5	6	6.5	50.5	44.0	44.0		7	15	51.0	57.0	7	15	35.0	36.0	7	8	5	6	41.5	118	130	142	7	7	45.0	53.0	5	12	5		0
44 FT	24	27	14	8	7	7.5	6	7	51.3	44.0	44.0	44.0	7	14	51.0	57.0	7	14	36.0	37.0	7	8	5	6	41.9	119	131	143	7	7	45.0	54.0	5	12	5		0
46 FT	25	27	14	8	7	7	6	7	51.3	45.0		45.0	7	14	51.0	57.0	7	14	35.0	36.0	7	7.5	5	6	42.0	119	131	143	7	6.5	45.0	53.0	5	12	5		0
48 FT	26	28	14	8	7	7	6	7	51.4	46.0		46.0	7	15	51.0	56.0	7	15	35.0	36.0	7	7.5	5	6	42.1	120	132	144	7	6.5	45.0	53.0	5	12	5		0
50 FT	26	29	15	8	7	7	6	7	52.1	50.0	50.0	50.0	7	14	51.0	56.0	7	14	35.0	36.0	7	7.5	6	8	45.5	121	133	145	7	6.5	45.0	54.0	5	12	6	8	0
								5		O8																											_



THE OFFICE MEMBER THE THE MEMBER THE MEMBER

SPECIAL DESIGNS ARE REQUIRED WHEN THE DESIGN FILL IS LESS THAN 1 FOOT OR GREATER THAN 50 FEET.

DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.

DESIGN FILLS ARE MEASURED FROM THE TOP OF TOP SLAB TO THE TOP OF EARTH FILL OR ROADWAY.

CULVERTS MEET STRENGTH AND SERVICEABILITY REQUIREMENTS FOR THE DESIGN VEHICULAR LIVE LOAD HL-93 MINUS THE LANE LOAD.



MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)



CONCRETE TRIPLE BOX CULVERT

MEMBER THICKNESS BAR SIZE. SPACING & DIMENSIONS

SPAN (S): 10 FEET HEIGHT (HT): 5 THRU 10 FEET

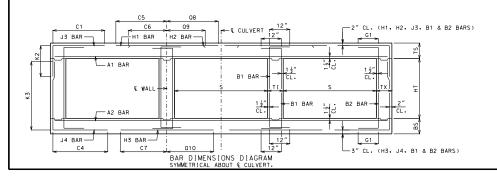
DATE EFFECTIVE: DATE PREPARED:

9/29/2011

703.87

SHEET NO. 14 OF 27

											S	PAN	S)	= 10	FT			HEIG	нт (н	T) =	11	FT OI	R 12	2 FT	OR 1	3 FT											\exists
		MEM	3ER									TOP SL	AB B	ARS											Е	BOTTOM	SLAB E	BARS						₩AL	L BAI	RS	
DESIGN		THICK	NESS	5	A1 E	BARS			J3	BARS				H1	BARS			H2	BARS		A2	BARS			J4	BARS				Н3	BARS		B1	BARS	B2	2 BAR	S
FILL	TS	вѕ	тх	ΤI	SIZE	SPA.	SIZE	SPA.	C1	HT=11	K2 HT=12	HT=13	SIZE	SPA.	C5	08	SIZE	SPA.	C6	09	SIZE	SPA.	SIZE	SPA.	C4	HT=11'	K3 HT=121	HT=131	SIZE	SPA.	C7	010	SIZE	SPA.	SIZE	SPA.	G1
1 FT	13	10	9	10	5	6.5	5	6.5	55.9	33.0	33.0	33.0	5	16	101.5	75.5	5	16	30.0	29.0	5	8.5	6	6	82.3	138	150	162	5	6.5	49.0	49.0	5	10	5	8.5	12
2 FT	13	10	10	10	5	6.5	5	6.5	56.5	33.0	33.0	33.0	5	14	101.5	75.5	5	14	29.0	29.0	5	8	6	6.5	83.0	138	150	162	5	6.5	47.0	48.0	5	12	5	8	12
4 FT	9	10	10	10	5	7	6	7	56.5	29.0	29.0	33.0	5	13	101.5	77.0	5	13	31.0	31.0	5	7	6	6	81.3	138	150	162	5	6	46.0	48.0	5	11	5	8	12
6 FT	9	11	10	10	5	8	6	7	75.6	29.0	29.0	33.0	5	13	54.0	53.0	5	13	29.0	29.0	5	7	6	6	77.8	139	151	163	5	6	44.0	47.0	5	12	5	8	12
8 FT	9	11	11	10	5	8	6	7	64.6	29.0	29.0	33.0	5	12	47.0	48.0	5	12	28.0	28.0	5	6.5	6	6.5	69.5	139	151	163	6	7	45.0	49.0	5	12	5	7.5	0
10 FT	10	11	11	10	5	8	5	6	61.1	30.0	30.0	30.0	5	12	46.0	47.0	5	12	28.0	28.0	5	6	6	6	65.8	139	151	163	6	6.5	45.0	48.0	5	12	5	7.5	0
12 FT	11	12	11	10	5	7.5	5	6	60.3	31.0	31.0	31.0	5	12	44.0	47.0	5	12	27.0	28.0	5	6	6	6	65.1	140	152	164	6	6.5	44.0	49.0	5	12	5	7.5	0
14 FT	12	13	11	10	5	7	6	7.5	62.6	32.0	32.0	36.0	5	12	43.0	46.0	5	12	27.0	28.0	5	6	6	6.5	64.4	141	153	165	6	6.5	44.0	49.0	5	12	5	7	0
16 FT	13	14	12	10	5	6.5	6	8	61.3	33.0	33.0	37.0	5	12	42.0	46.0	5	12	27.0	28.0	6	8	6	7	63.0	142	154	166	6	7	44.0	49.0	5	12	5	7	0
18 FT	13	15	12	10	5	6.5	6	7	59.3	33.0	37.0	37.0	6	15	45.0	48.0	6	15	30.0	31.0	6	7.5	6	6.5	62.8	143	155	167	6	7	44.0	49.0	5	12	5	7	0
20 FT	14	16	13	10	5	6	6	7.5	58.8	34.0	38.0	38.0	6	15	44.0	48.0	6	15	30.0	31.0	6	7	6	7	61.8	144	156	168	6	7	44.0	49.0	5	12	5	6.5	0
22 FT	15	17	13	10	6	8	6	6.5	64.6	35.0	39.0	39.0	6	15	50.0	54.0	6	15	36.0	37.0	6	7	6	6.5	61.4	145	157	169	6	6.5	44.0	50.0	5	12	5	6.5	0
24 FT	16	18	14	10	6	8	6	7	64.6	36.0	40.0	40.0	6	15	49.0	54.0	6	15	35.0	37.0	6	6.5	6	6.5	60.5	146	158	170	6	6.5	44.0	50.0	5	12	5	6	0
26 FT	17	19	14	10	6	7.5	6	6.5	64.5	37.0	41.0	41.0	6	14	49.0	54.0	6	14	35.0	37.0	6	6.5	6	6.5	60.4	147	159	171	6	6	44.0	50.0	5	12	5	6	0
28 FT	18	20	15	10	6	7	6	6.5	64.9	42.0	42.0	42.0	6	13	48.0	54.0	6	13	34.0	36.0	6	6.5	6	6.5	60.3	148	160	172	6	6	44.0	50.0	5	12	6	8	0
30 FT	19	21	15	10	6	6.5	6	6.5	65.1	43.0	43.0	43.0	6	13	48.0	54.0	6	13	33.0	35.0	6	6.5	6	6.5	60.4	149	161	173	7	7.5	47.0	53.0	5	12	6	8	0
32 FT	20	22	16	10	6	6.5	6	6.5	65.5	44.0	44.0	44.0	6	12	48.0	53.0	6	12	33.0	34.0	6	6	6	7	60.5	150	162	174	7	7.5	47.0	53.0	5	12	6	8	0
34 FT	20	23	16	10	6	6.5	6	6.5	63.5	44.0	44.0	44.0	6	12	47.0	53.0	6	12	33.0	35.0	6	6	6	7.5	58.9	151	163	175	7	7.5	46.0	53.0	5	12	6	8	0
36 FT	21	24	16	10	6	6	6	6	63.9	45.0	45.0	45.0	6	12	47.0	53.0	6	12	32.0	34.0	6	6	6	7	59.1	152	164	176	7	7.5	46.0	53.0	5	12	6	8	0
38 FT	22	24	17	10	6	6	6	6	64.4	46.0	46.0	46.0	7	15	52.0	58.0	7	15	37.0	38.0	6	6	6	7	59.0	152	164	176	7	7	46.0	53.0	5	12	6	7.5	0
40 FT	23	25	17	10	6	6	6	6	64.6	47.0	47.0	47.0	7	15	52.0	57.0	7	15	36.0	37.0	6	6	6	7	59.3	153	165	177	7	7	46.0	53.0	5	12	6	7.5	0
42 FT	23	26	18	10	7	7.5	6	6	65.0	47.0	47.0	47.0	7	15	52.0	57.0	7	15	37.0	38.0	7	8	6	6.5	59.6	154	166	178	7	7	46.0	54.0	5	12	6	7	0
44 FT	24	27	19	10	7	7.5	6	6	65.8	44.0	48.0	48.0	7	15	52.0	57.0	7	15	36.0	37.0	7	8	6	6.5	60.0	155	167	179	7	7	46.0	54.0	5	12	6	7	0
46 FT	24	27	19	10	7	7	6	6	65.6	48.0	48.0	48.0	7	14	52.0	57.0	7	14	36.0	38.0	7	7.5	6	6.5	59.9	155	167	179	7	6.5	46.0	54.0	5	12	6	6.5	0
48 FT	25	28	20	10	7	7	6	6	66.4	45.0	49.0	49.0	7	14	52.0	56.0	7	14	36.0	37.0	7	7.5	6	6	60.4	156	168	180	7	6.5	46.0	54.0	5	12	6	6.5	0
50 FT	26	29	20	10	7	7	7	7.5	71.6	50.0	50.0	50.0	7	15	51.0	55.0	7	15	36.0	37.0	7	7.5	6	6	60.6	157	169	181	7	6.5	47.0	54.0	5	12	6	6.5	0



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MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)



CONCRETE TRIPLE BOX CULVERT

MEMBER THICKNESS BAR SIZE, SPACING & DIMENSIONS

SPAN (S): 10 FEET HEIGHT (HT): 11 THRU 13 FEET

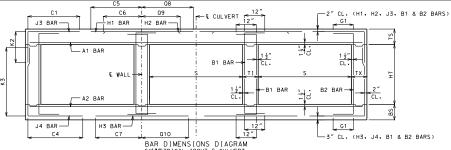
DATE EFFECTIVE: DATE PREPARED: 9/29/2011

703.87

15 OF 27

SHEET NO.

															FT			HE I G	нт (н	T) =	9 F	T OR	10	FT (DR 11	FT											
	Ι.	MEME										TOP SL	AB B								_					OTTOM	SLAB E	BARS					\vdash		L BAI		_
DESIGN		HICK	NE SS	5	A1 B	ARS			J:	BARS				H1	BARS			H2	BARS		A2	BARS			J4	BARS				Н3	BARS		B1	BARS	B2	2 BARS	,
FILL	TS	BS	ТX	TIS	SIZE	SPA.	SIZE	SPA.	C1	HT=9'	K2 HT=10'	HT=11	SIZE	SPA.	C5	08	SIZE	SPA.	C6	09	SIZE	SPA.	SIZE	SPA.	C4	HT=9'	K3 HT=101	HT=11'	SIZE	SPA.	C7	010	SIZE	SPA.	SIZE	SPA.	G1
1 FT	13	9	9	9	5	6.5	5	8	59.3	33.0	33.0	33.0	5	13	109.5	81.5	5	13	31.0	33.0	5	7.5	6	6	74.5	113	125	137	6	7	51.0	53.0	5	11.5	5	10.5	12
2 FT	14	10	9	9	5	6	5	8	59.3	34.0	34.0	34.0	5	14	109.5	81.5	5	14	29.0	28.0	5	7.5	6	7	70.6	114	126	138	5	6	47.0	50.0	5	12	5	10.5	12
4 FT	10	10	9	9	5	6.5	5	6	59.3	30.0	30.0	30.0	5	13	109.5	83.0	5	13	32.0	33.0	5	7	6	6.5	64.1	114	126	138	6	6.5	50.0	53.0	5	11.5	5	9.5	12
6 FT	10	10	9	9	5	7	5	6	56.6	30.0	30.0	30.0	5	12	55.0	61.0	5	12	30.0	31.0	5	7	6	6	57.8	114	126	138	6	6	48.0	52.0	5	12	5	9.5	12
8 FT	10	11	9	9	5	7	6	7.5	55.5	30.0		34.0	6	15	53.0	56.0	6	15	32.0	33.0	5	6.5	6	6	55.6	115	127	139	6	6	47.0	52.0	5	12	5		0
10 FT	11	12	9	9	5	7	6	7	53.5	31.0	35.0	35.0	6	15	51.0	55.0	6	15	32.0	33.0	5	6	6	6	53.8	116	128	140	6	6.5	46.0	52.0	5	12	5		0
12 FT	12	13	9	9	5	7	6	6.5	51.9	32.0	36.0	36.0	6	15	49.0	54.0	6	15	31.0	33.0	5	6	6	6	52.4	117	129	141	6	6.5	46.0	52.0	5	12	5		0
14 FT	13	14	9	9		6.5	6	6	50.5	33.0		37.0	6	15	48.0	53.0	6	15	31.0	33.0	6	8	6	6	51.3	118	130	142	6	6.5	45.0	52.0	5	12	5		0
16 FT	14	15	10	9	5	6	6	7	49.9	34.0		38.0	6	15	47.0	53.0	6	15	31.0	33.0	6	7.5	6	7	50.4	119	131	143	6	6.5	45.0	52.0	5	12	5	8	0
18 FT	15	16	10	9	6	8	6	7	54.9	35.0	35.0	39.0	6	15	52.0	59.0	6	15	37.0	39.0	6	7	6	7	49.6	120	132	144	6	6.5	45.0	53.0	5	12	5	8	0
20 FT	16	17	11	9	6	8	6	7.5	54.8	36.0	36.0	40.0	6	14	52.0	58.0	6	14	36.0	39.0	6	7	6	8	49.3	121	133	145	6	6.5	45.0	53.0	5	12	5		0
22 FT	17	18	12	9		7.5	6	8	54.8	37.0		37.0	6	14	51.0	58.0	6	14	36.0	39.0	6	6.5	5	6	45.9	122	134	146	6	6.5	45.0	53.0	5	12	5	7.5	0
24 FT		20	12	9	6	7	6	7.5	54.4	38.0		38.0	6	13	51.0	58.0	6	13	36.0	38.0	6	6	5	6	45.8	124	136	148	6	6	45.0	53.0	5	12	5	7	0
26 FT	19	21	12	9	_	6.5	6	7	53.9	39.0		43.0	6	13	50.0	58.0	6	13	35.0	38.0	6	6	6	8.5	48.4	125	137	149	7	7.5	48.0	56.0	5	12	5	7	0
28 FT	20	22	13	9	_	6.5	6	7.5	54.3	40.0	40.0	40.0	6	12	50.0	58.0	6	12	35.0	37.0	6	6	5	6	45.4	126	138	150	7	7.5	48.0	57.0	5	12	5	6.5	0
30 FT	21	23	13	9	6	6	6	7	54.1	41.0		41.0	6	12	50.0	57.0	6	12	34.0	36.0	7	8	5	6	45.4	127	139	151	7	7	48.0	57.0	5	12	5	6.5	0
32 FT	22	24	13	9	6	6	6	6.5	54.1	42.0		46.0	7	15	54.0	62.0	7	15	39.0	41.0	7	7.5	6	8	48.4	128	140	152	7	7	48.0	57.0	5	12	5	6.5	0
34 FT	23	25	14	9	7	7.5	6	7	54.8	43.0	43.0	43.0	7	15	54.0	62.0	7	15	38.0	40.0	1	7.5	5	6	45.8	129	141	153	7	6.5	48.0	57.0	5	12	5	6	0
36 FT	23	25	14	9	7	-7	6		53.3	43.0		43.0	1	14	54.0	62.0	1	14	38.0	40.0	1	1	5	6	44.1	129	141	153	7	6.5	48.0	57.0	5	12	5	6	0
38 FT	24	26	14	9	7	7.5			53.4	44.0		44.0		14	54.0	61.0		14	38.0	40.0	<u> </u>		5	6	44.3	130	142	154	1	6.5	48.0	57.0	5	12	15	6	0
40 FT	25	27	14	9	1		6	6.5	53.4	45.0	45.0	45.0		14	54.0	61.0		14	37.0	39.0			5	6	44.5	131	143	155	1	6.5	48.0	57.0	5	12	5	6	0
42 FT	26	28	15	9	1		6	100	54.3	46.0		50.0	1	13	54.0	60.0	+ 4	13	37.0	38.0	1 4	1 4	6	8	48.0	132	144	156	+ -	6	48.0	57.0	5	12	6	8	0
44 FT	27	30	15	9	-	6.5	6	6.5	54.3	51.0	51.0	51.0	1	13	53.0	60.0	+ 4	13	36.0	38.0	1 4	1 4	6	8	48.1	133	145	157 158	+-	6	48.0	57.0	5	12	6	8	
46 FT 48 FT	28	30	15	9		6.5	6	6.5	55.0	51.0	51.0	52.0	7	13	53.0	59.0	7	13	36.0	37.0	7	1		7.5	48.5	134	146	158	7	6	48.0	57.0	5	12	6	8	0
50 FT		31	16 16	9		6.5	6		55.0	53.0	53.0	53.0	1	13	53.0	59.0	7	13	36.0	37.0	1 7	6.5	6		48.5	135	146	158	1 7	6	48.0	57.0		12	6		0
20 FT	29	ונ	10	3	- 1	0.5	L 0	6.5	100.1	1 22.0	33.0	22.0	_ ′	13	33.0	29.0	1 /	10	20.0	31.0	_ ′	10.5	10	7.5	40.8	135	147	139		_ 0	40.0	31.0	5	_ '	ட	_ 6	



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JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)



MEMBER THICKNESS BAR SIZE. SPACING & DIMENSIONS

SPAN (S): 11 FEET HEIGHT (HT): 6 THRU 11 FEET

DATE EFFECTIVE: DATE PREPARED:

9/29/2011

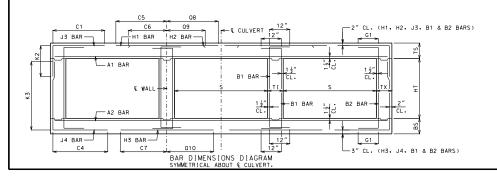
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SHEET NO. 16 OF 27

CULVERTS MEET STRENGTH AND SERVICEABILITY REQUIREMENTS FOR THE DESIGN VEHICULAR LIVE LOAD HL-93 MINUS THE LANE LOAD.

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 WEST CAPITOL

											_			= 11	FT			HE I G	нт (н	T) =	12	FT O	R 13	3 FT		4 FT											\Box
		MEME	BER									TOP SL	AB B	ARS											Е	MOTTO	SLAB B	BARS						₩AL	L BA	.RS	
DESIGN	1	HICK	NESS	>	A1	BARS			J3	BARS				H1	BARS			H2	BARS		A2	BARS			J4	BARS				Н3	BARS		B1	BARS	B2	2 BAR	5
FILL	TS	BS	тх	ΤI	SIZE	SPA.	SIZE	SPA.	C1	HT=12	K2 HT=13'	HT=14'	SIZE	SPA.	C5	08	SIZE	SPA.	C6	09	SIZE	SPA.	SIZE	SPA.	C4	HT=121	K3 HT=131	HT=14'	SIZE	SPA.	C7	010	SIZE	SPA.	SIZE	SPA.	G1
1 FT	13	10	10	11	5	6.5	5	6	60.3	33.0	33.0	33.0	5	13	110.5	82.5	5	13	31.0	33.0	5	7.5	6	6	89.3	150	162	174	5	6	51.0	51.0	5	10	5	8	12
2 FT	14	11	10	11	5	6	5	6	60.3	34.0	34.0	34.0	5	14	110.5	82.5	5	14	30.0	32.0	5	7.5	6	6	89.3	151	163	175	5	6	50.0	51.0	5	12	5	8	12
4 FT	10	11	11	11	5	7	5	6	60.9	30.0	30.0	30.0	5	13	110.5	80.0	5	13	33.0	33.0	5	7	6	6.5	85.9	151	163	175	5	6	49.0	51.0	5	12	5	7.5	12
6 FT	10	11	11	11	5	7.5	5	6	79.0	30.0	30.0	30.0	5	12	58.0	57.0	5	12	31.0	31.0	5	6.5	6	6	77.5	151	163	175	6	6.5	50.0	53.0	5	12	5	7.5	12
8 FT	10	11	12	11	5	7.5	6	7.5	70.1	30.0	30.0	34.0	6	15	54.0	55.0	6	15	33.0	33.0	5	6.5	6	6	70.9	151	163	175	6	6	48.0	52.0	5	12	5	7	0
10 FT	11	12	12	11	5	7.5	6	8	68.5	31.0	31.0	35.0	6	16	52.0	54.0	6	16	32.0	33.0	5	6	6	6	69.9	152	164	176	6	6	47.0	52.0	5	12	5	7	0
12 FT	12	13	12	11	5	7	6	8	67.4	32.0	32.0	36.0	6	16	50.0	53.0	6	16	32.0	33.0	5	6	6	6.5	69.0	153	165	177	6	6	47.0	52.0	5	12	5	7	0
14 FT	13	14	12	11	5	6.5	6	7	66.4	33.0	37.0	37.0	6	16	49.0	53.0	6	16	32.0	33.0	6	8	6	6.5	68.3	154	166	178	6	6.5	47.0	52.0	5	12	5	6.5	0
16 FT	14	15	13	11	5	6	6	7	64.9	34.0	38.0	38.0	6	15	48.0	52.0	6	15	32.0	33.0	6	7.5	6	7	66.6	155	167	179	6	6.5	47.0	52.0	5	12	5	6.5	0
18 FT	15	16	13	11	9	8	6	6.5	70.3	39.0	39.0	39.0	6	15	54.0	58.0	6	15	37.0	39.0	6	7	6	6	66.0	156	168	180	6	6.5	47.0	52.0	5	12	5	6.5	0
20 FT	15	17	14	11	6	8	6	6.5	68.4	39.0	39.0	39.0	6	14	53.0	58.0	6	14	37.0	39.0	6	7	6	6.5	65.1	157	169	181	6	6.5	46.0	53.0	5	12	5	6	0
22 FT	17	18	14	11	6	7.5	6	6.5	69.0	41.0	41.0	41.0	6	14	53.0	58.0	6	14	37.0	39.0	6	6	6	6	64.5	158	170	182	6	6	46.0	53.0	5	12	5	6	0
24 FT	18	20	15	11	6	7	6	6.5	68.9	42.0	42.0	42.0	6	13	52.0	58.0	6	13	36.0	38.0	6	6	6	6	64.6	160	172	184	6	6	46.0	53.0	5	12	6	8	0
26 FT	19	21	15	11	6	6.5	6	6	68.6	43.0	43.0	43.0	6	13	52.0	57.0	6	13	36.0	38.0	6	6	6	6	64.3	161	173	185	7	7.5	49.0	56.0	5	12	6	8	0
28 FT	20	22	16	11	6	6.5	6	6	68.6	44.0	44.0	44.0	6	12	51.0	57.0	6	12	35.0	37.0	6	6	6	6	63.9	162	174	186	7	7.5	49.0	56.0	5	12	6	8	0
30 FT	21	23	17	11	6	6	6	6	69.0	45.0	45.0	45.0	6	12	51.0	57.0	6	12	34.0	36.0	7	8	6	6.5	64.0	163	175	187	7	7	49.0	57.0	5	12	6	7.5	0
32 FT	21	24	17	11	6	6	6	6	68.6	45.0	45.0	45.0	6	12	51.0	57.0	6	12	35.0	37.0	7	7.5	6	6.5	64.1	164	176	188	7	7	49.0	57.0	5	12	6	7.5	0
34 FT	22	25	18	11	6	6	6	6	69.1	46.0	46.0	46.0	7	15	55.0	62.0	7	15	40.0	41.0	7	7.5	6	6.5	64.4	165	177	189	7	6.5	49.0	57.0	5	12	6	7	0
36 FT	23	26	18	11	7	7.5	7	7.5	74.3	47.0	47.0	47.0	7	15	55.0	61.0	7	15	39.0	41.0	7	7.5	6	6	64.5	166	178	190	7	6.5	49.0	57.0	5	12	6	7	0
38 FT	24	26	18	11	7	7.5	7	8	72.6	48.0	48.0	48.0	7	14	55.0	61.0	7	14	38.0	40.0	7	7	6	6.5	62.4	166	178	190	7	6.5	49.0	57.0	5	12	6	7	0
40 FT	25	27	18	11	7	7	7	7	72.9	49.0	49.0	49.0	7	14	55.0	61.0	7	14	38.0	39.0	7	7	6	6	62.6	167	179	191	7	6.5	49.0	57.0	5	12	6	7	0
42 FT	25	28	19	11	7	7	7	7	73.3	49.0	49.0	49.0	7	14	55.0	60.0	7	14	38.0	40.0	7	7	6	6	62.9	168	180	192	7	6.5	49.0	57.0	5	12	6	6.5	0
44 FT	26	29	20	11	7	7	7	7.5	74.0	50.0	50.0	50.0	7	13	54.0	60.0	7	13	38.0	39.0	7	7	6	6	63.3	169	181	193	7	6	49.0	57.0	5	12	6	6.5	0
46 FT	27	30	21	11	7	6.5	7	7.5	74.6	51.0	51.0	51.0	7	13	54.0	59.0	7	13	37.0	38.0	7	7	6	6	63.6	170	182	194	7	6	49.0	57.0	5	12	6	6	0
48 FT	27	30	21	11	7	6	7	7	74.5	51.0	51.0	51.0	7	12	54.0	59.0	7	12	37.0	39.0	7	6	6	6	63.5	170	182	194	7	6	49.0	57.0	5	12	6	6	0
50 FT	28	31	22	11	7	6.5	7	7	75.3	52.0	52.0	58.0	7	13	54.0	59.0	7	13	37.0	38.0	7	6.5	7	7.5	67.0	171	183	195	7	6	49.0	58.0	5	12	6	6	0



IF DESIGN FILL IS BETWEEN TABULATED DESIGN FILLS. USE THE NEXT GREATER TABULATED DESIGN FILL, EXCEPT FOR DESIGN FILLS BETWEEN 2 FEET AND 4 FEET. FOR DESIGN FILLS BETWEEN 2 FEET AND 4 FEET SET THE GREATER MEMBER THICKNESS. AREA OF REINFORCEMENT AND BAR DIMENSIONS FROM THE 2 FEET AND 4 FEET TABULATED DESIGN FILLS. AREA OF REINFORCEMENT EDUALS BAR AREA PER FOOT SPACING.

SPECIAL DESIGNS ARE REQUIRED WHEN THE DESIGN FILL IS LESS THAN 1 FOOT OR GREATER THAN 50 FEET.

DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.

DESIGN FILLS ARE MEASURED FROM THE TOP OF TOP SLAB TO THE TOP OF EARTH FILL OR ROADWAY.

CULVERTS MEET STRENGTH AND SERVICEABILITY REQUIREMENTS FOR THE DESIGN VEHICULAR LIVE LOAD HL-93 MINUS THE LANE LOAD.



MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)



CONCRETE TRIPLE BOX CULVERT

MEMBER THICKNESS BAR SIZE, SPACING & DIMENSIONS

SPAN (S): 11 FEET HEIGHT (HT): 12 THRU 14 FEET

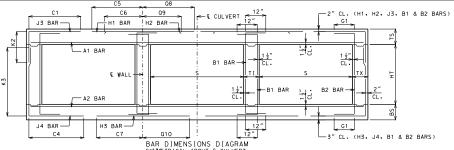
DATE EFFECTIVE: DATE PREPARED:

9/29/2011

703.87

SHEET NO. 17 OF 27

														= 12	FI			HE I G	HI (H	T) =	9 F	I UK	10	FIL	JR 11	FI											
		MEMB	ER	T								TOP SL	AB B													BOTTOM	SLAB E	BARS							L BAF		_]
DESIGN		HICK	NESS		A1 E	BARS			J:	3 BARS				H1	BARS			H2	BARS		A2 I	BARS			J4	BARS				Н3	BARS		B1 F	BARS	B2	BARS	_
FILL	TS	вѕ	тх	TIS	IZE	SPA.	SIZE	SPA.	C1	HT=9'	K2 HT=10	HT=11'	SIZE	SPA.	C5	08	SIZE	SPA.	C6	09	SIZE	SPA.	SIZE	SPA.	C4	HT=9'	K3 HT=101	HT=11	SIZE	SPA.	C7	010	SIZE	SPA.	SIZE	SPA.	G1
1 FT	14	10	8	9	5	6	5	7.5	62.3	34.0	34.0	34.0	5	12	117.5	87.5	5	12	31.0	35.0	5	7.5	6	6	79.4	114	126	138	5	6	51.0	54.0	5	12	5	10	12
2 FT	14	10	9	9	5	6	5	8	62.9	34.0	34.0	34.0	5	12	117.5	87.5	5	12	30.0	33.0	5	7	6	6.5	68.6	114	126	138	6	6.5	53.0	56.0	5	12	5	10.5	12
4 FT	11	10	9	9	5	6	6	7	75.1	31.0	31.0	35.0	5	12	82.0	89.0	5	12	34.0	36.0	5	7	6	6	61.3	114	126	138	6	6	52.0	56.0	5	12	5	10	12
6 FT	11	11	9	9	5	6.5	6	7	59.8	31.0	35.0	35.0	6	16	61.0	70.0	6	16	35.0	36.0	5	6.5	6	6	57.5	115	127	139	6	6	50.0	56.0	5	12	5	9.5	12
8 FT	11	12	9	9	5	6.5	6	7	55.3	31.0	31.0	35.0	6	15	56.0	60.0	6	15	33.0	34.0	5	6	6	6.5	54.5	116	128	140	6	6	49.0	56.0	5	12	5	9	0
10 FT	12	13	9	9	5	6.5	6	6.5	52.5	32.0	32.0	36.0	6	14	54.0	59.0	6	14	33.0	34.0	5	6	6	6.5	52.4	117	129	141	6	6	48.0	56.0	5	12	5	8.5	0
12 FT	13	14	9	9	5	6	6	6.5	50.4	33.0	33.0	37.0	6	14	52.0	58.0	6	14	32.0	34.0	6	8	6	6.5	50.6	118	130	142	6	6	48.0	56.0	5	12		8.5	0
14 FT	14	15	9	9	5	6	6	6.5	48.8	34.0		38.0	6	14	51.0	57.0	6	14	32.0	34.0	6	7.5	6	6.5	49.4	119	131	143	6	6	48.0	56.0	5	12	5	8.5	0
16 FT	15	16	10	9	6	8	6	7.5	54.3	35.0	35.0	39.0	6	13	55.0	63.0	6	13	38.0	40.0	6	7	6	7.5	48.5	120	132	144	6	6	47.0	56.0	5	12	5	8	0
18 FT	16	17	11	9	6	8	6	8	54.3	36.0		36.0	6	13	55.0	62.0	6	13	38.0	40.0	6	7	5	6	45.4	121	133	145	6		47.0	56.0	5	12	5	8	0
20 FT	17	18	11	9	6	7.5	6	7.5	53.6	37.0	37.0	41.0	6	13	54.0	62.0	6	13	37.0	40.0	6	6	6	8	47.8	122	134	146	6	6	47.0	56.0	5	12		7.5	0
22 FT	18	20	11	9	6	7	6	6.5	53.3	38.0	38.0	42.0	6	12	54.0	62.0	6	12	37.0	40.0	6	6	6	7.5	47.5	124	136	148	6	6	47.0	57.0	5	12	5	7.5	0
24 FT	19	21	12	9	6	6.5	6	7	53.5	39.0		39.0	6	12	53.0	62.0	6	12	37.0	40.0	7	8	5	6	44.5	125	137	149	7		50.0	60.0	5	12	5	. 7	0
26 FT	20	22	13	9	6	6	6	7.5	53.9	40.0		40.0	6	12	53.0	61.0	6	12	37.0	40.0	7	7.5	5	6	44.6	126	138	150	7		50.0	60.0	5	12	5	7	0
28 FT		23	13	9	6	6	6	7.5	53.5	42.0		42.0	7	15	57.0	66.0	7	15	40.0	43.0	7	7	5	6	44.5	127	139	151	7		50.0	60.0	5	12		6.5	0
				9	7	7.5	6	7	53.4	43.0		43.0	7		57.0	66.0	7	15	40.0	42.0	7	7	5	6	44.4	129	141	153	7		50.0	60.0	5	12		6.5	0
			13	9	7	7.5	6	6.5	53.3				7	14	57.0	66.0	7	14	40.0	42.0	7	7	_	8.5	47.4	130	142	154	7		50.0	60.0	5	12		6.5	0
	25	26	13	9	7	7	6	6	53.0	45.0		49.0	7	14	57.0	65.0	7	14	39.0	41.0	7	6	6	7.5	47.3	130	142	154	7		50.0	60.0	5	12		6.5	0
36 FT	26	28	14	9	7	7	6	6.5	53.9	46.0	46.0	46.0	7	13	56.0	65.0	7	13	38.0	40.0	7	7	5	6	44.9	132	144	156	7		50.0	60.0	5	12	5	6	0
	26	29	15	9	7	6.5	6	6.5	54.6	50.0	50.0	50.0	7	13	56.0	65.0	7	13	39.0	41.0	7	6.5	6	8	48.1	133	145	157	7		50.0	60.0	5	12		8.5	0
		29	15	9	7	6.5	6	7	53.4	51.0	51.0	51.0	7	13	56.0	64.0	7	13	38.0	40.0	7	6	6	8	46.9	133	145	157	8		56.0	66.0	5	12	5	6	0
		30	15	9	7	6.5	6	6.5	53.4	52.0		52.0	7	12	56.0	64.0	7	12	38.0	39.0	7	6	6	8	47.0	134	146	158	8		56.0	66.0	5	12	6	8	0
44 FT	29	٠, ١		9	7	6	6	6.5	53.4	53.0	53.0	53.0	7	12	56.0	63.0	7	12	37.0	39.0	7	6	6	7.5	47.1	135	147	159	8		56.0	66.0	5	12	6	8	0
		32	15	9	7	6	6	6.5	53.5	54.0		54.0	7	12	55.0	63.0	7	12	37.0	38.0	7	6	6	7.5	47.4	136	148	160	8		56.0	66.0	5	12	6	8	0
				9	7	6	6	6	53.5			55.0	7	12	55.0	62.0	7	12	37.0	38.0	7	6	6	7	47.5	137	149	161	8		56.0	66.0	5	12	6		0
50 FT	31	34	16	9	8	7.5	6	6	54.4	55.0	55.0	55.0	7	12	55.0	62.0	7	12	37.0	38.0	7	6	6	7	47.9	138	150	162	8	7	56.0	67.0	5	12	6	8	0



THE DESIGN FILLS BETWEEN TABLLATED DESIGN FILLS. USE THE NET I THE DESIGN FILL TO BE SEN FILLS THE THE DESIGN FILES THE NET A FEET FILE ADDUCTOR TO SEN FILLS FILES FILES FILES AND A FEET USE THE GREATER BETWEEN 2 FEET AND A FEET TABLLATED DESIGN FILLS. THE GREATER BETWEEN THE SEN FILES FILES FILES FILES FILES DIMENSIONS FROM THE 2 FEET AND A FEET TABLLATED DESIGN FILLS. AREA OF REINFORCEMENT EQUALS BAR AREA PER FOOT SPACING

SPECIAL DESIGNS ARE REQUIRED WHEN THE DESIGN FILL IS LESS THAN 1 FOOT OR GREATER THAN 50 FEET.

DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.

DESIGN FILLS ARE MEASURED FROM THE TOP OF TOP SLAB TO THE TOP OF EARTH FILL OR ROADWAY.

CULVERTS MEET STRENGTH AND SERVICEABILITY REQUIREMENTS FOR THE DESIGN VEHICULAR LIVE LOAD HL-93 MINUS THE LANE LOAD.



MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

105 WEST CAPITOL

JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)



CONCRETE TRIPLE BOX CULVERT

MEMBER THICKNESS BAR SIZE. SPACING & DIMENSIONS

SPAN (S): 12 FEET HEIGHT (HT): 6 THRU 11 FEET

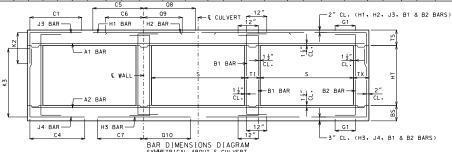
DATE EFFECTIVE: DATE PREPARED:

9/29/2011

703.87

SHEET NO. 18 OF 27

											SI	PAN	(S)	= 12	FT			HE I GH	IT (HI	Γ) =	: 14	FT (OR 15	5 FT											
		MEMI										TOP	SLAB	BARS										Е	BOTTOM	SLAB I	BARS					WAL			
DESIGN	T	HICK	NESS	•	A1	BARS			J:	BARS			H1	BARS			H2	BARS		A2	BARS			J4	BARS			Н3	BARS		B1 I	BARS	B2	2 BARS	j
FILL	TS	вѕ	ТX	ΤI	SIZE	SPA.	SIZE	SPA.	C1	HT=14'	2 HT=15	SIZE	SPA.	C5	08	SIZE	SPA.	C6	09	SIZE	SPA.	SIZE	SPA.	C4	K HT=14'	3 HT=15′	SIZE	SPA.	C7	010	SIZE	SPA.	SIZE	SPA.	G1
1 FT	14	11	10	12	5	6	6	7.5	64.0	34.0	38.0	5	12	119.5	88.5	5	12	32.0	35.0	5	7	6	6	95.5	175	187	5	6	55.0	55.0	5	12	5	8	12
2 FT	14	12	10	12	5	6	6	7	64.0	34.0	38.0	5	12	119.5	88.5	5	12	31.0	34.0	5	7	6	6	95.5	176	188	5	6	54.0	55.0	5	12	5	8	12
4 FT	10	11	12	12	5	6	6	7.5	68.3	34.0	34.0	6	15	121.5	77.0	6	15	37.0	37.0	5	6.5	6	6	86.8	175	187	6	6.5	55.0	57.0	5	11	5	7	12
6 FT	10	12	12	12	5	6.5	6	7	80.0	34.0	34.0	6	15	61.0	61.0	6	15	35.0	35.0	5	6	6	6.5	83.1	176	188	6	6.5	53.0	57.0	5	12	5	7	12
8 FT	11	12	12	12	5	7	6	7.5	76.8	35.0	35.0	6	15	58.0	59.0	6	15	35.0	35.0	5	6	6	6	77.1	176	188	6	6	52.0	55.0	5	12	5	7	0
10 FT	12	13	12	12	5	6.5	6	7.5	74.4	36.0	36.0	6	15	56.0	58.0	6	15	34.0	35.0	5	6	6	6	75.5		189	6	6	51.0	55.0	5	12	5	6.5	0
12 FT	13	14	13	12	5	6.5	6	7.5	71.5	37.0	37.0	6	15	54.0	57.0	6	15	34.0	35.0	6	8	6	6	73.0	178	190	6	6	50.0	55.0	5	12	5	6.5	0
14 FT	14	15	13	12	5	6	6	6.5	70.3	38.0	38.0	6	14	52.0	56.0	6	14	33.0	35.0	6	7.5	6	6	72.0	179	191	6	6	50.0	55.0	5	12	5	6.5	0
16 FT	15	16	14	12	6	8	6	6.5	74.5	39.0	39.0	6	14	57.0	62.0	6	14	39.0	41.0	6	7	6	6.5	70.3		192	6	6	49.0	55.0	5	12	5	6	0
18 FT	15	17	15	12	6	7.5	6	6.5	72.4	39.0	39.0	6	13	56.0	61.0	6	13	39.0	40.0	6	6.5	6	6.5	69.0	181	193	6	6	49.0	56.0	5	12	6	8	0
20 FT	17	19	15	12	6	7.5	6	6	73.0	41.0	41.0	6	13	56.0	61.0	6	13	39.0	41.0	6	6	6	6	69.6	183	195	6	6	49.0	56.0	5	12	6	8	0
22 FT	18	20	16	12	6	7	6	6.5	72.8	42.0	42.0	6	13	55.0	61.0	6	13	39.0	41.0	6	6	6	6	68.4	184	196	6	6	49.0	56.0	5	12	6	8	0
24 FT	19	21	16	12	6	6.5	6	6	72.4	43.0	43.0	6	13	55.0	61.0	6	13	38.0	41.0	7	8	7	7.5	71.1	185	197	7	7.5	52.0	59.0	5	12	6	8	0
26 FT	20	22	16	12	6	6.5	7	7.5	77.1	44.0	50.0	6	12	55.0	61.0	6	12	38.0	40.0	7	7.5	7	7	70.8	186	198	7	7.5	52.0	60.0	5	12	6	8	0
28 FT	21	23	17	12	6	6	7	7.5	77.1	45.0	51.0	6	12	54.0	60.0	6	12	37.0	40.0	7	6.5	7	7.5	70.5	187	199	7	6.5	52.0	60.0	5	12	6	7.5	0
30 FT	22	25	18	12	6	6	7	7.5	77.3	46.0	46.0	7	15	59.0	65.0	7	15	42.0	44.0	7	7	6	6	67.8	189	201	7	6.5	52.0	60.0	5	12	6	7	0
32 FT	23	26	19	12	7	7.5	7	7.5	77.5	47.0	47.0	7	15	58.0	65.0	7	15	41.0	44.0	7	7	6	6	67.8	190	202	7	6.5	52.0	60.0	5	12	6	6.5	0
34 FT	24	27	19	12	7	7.5	7	7	77.6	48.0	48.0	7	14	58.0	65.0	7	14	41.0	43.0	7	7	6	6	67.9	191	203	7	6	52.0	60.0	5	12	6	6.5	0
36 FT	25	28	20	12	7	7	7	7.5	78.1	49.0	49.0	7	14	58.0	64.0	7	14	40.0	42.0	7	7	6	6	68.1	192	204	7	6	52.0	60.0	5	12	6	6.5	0
38 FT	26	29	21	12	7	7	7	7.5	78.6	50.0	50.0	7	13	58.0	64.0	7	13	40.0	41.0	7	6.5	6	6	68.3	193	205	7	6	52.0	61.0	5	12	6	6	0
40 FT	27	30	21	12	7	6.5	7	7.5	77.1	51.0	51.0	7	13	57.0	63.0	7	13	39.0	40.0	7	6.5	6	6	66.5	194	206	7	6	52.0	61.0	5	12	6	6	0
42 FT	27	31	21	12	7	6	7	7	77.0	51.0	51.0	7	12	57.0	63.0	7	12	40.0	41.0	7	6.5	6	6	66.8	195	207	7	6	52.0	61.0	5	12	6	6	0
44 FT	28	31	22	12	7	6.5	7	7	77.6	52.0	58.0	7	12	57.0	63.0	7	12	39.0	40.0	7	6	7	7.5	69.6	195	207	8	7.5	58.0	67.0	5	12	6	6	0
46 FT	29	32	22	12	7	6	7	6.5	77.9	59.0	59.0	7	12	57.0	62.0	7	12	38.0	40.0	7	6	7	7.5	70.0	196	208	8	7.5	58.0	67.0	5	12	6	6	0
48 FT	30	33	23	12	7	6	7	6.5	78.6	54.0	60.0	7	12	57.0	62.0	7	12	38.0	39.0	7	6	7	7.5	70.4	197	209	8	7	58.0	67.0	5	12	7	8	0
50 FT	30	34	24	12	7	6	7	6.5	79.1	54.0	60.0	7	12	57.0	62.0	7	12	38.0	39.0	7	6	7	7	70.6	198	210	8	7	58.0	67.0	5	12	<u> </u>	8	0
							CF			O8																									



THEORES (ON FILLS). ETWEEN TABLEATED DESIGN FILLS, USE THE NETT PROBLEM FOR THE PROPERTY OF TH

SPECIAL DESIGNS ARE REQUIRED WHEN THE DESIGN FILL IS LESS THAN 1 FOOT OR GREATER THAN 50 FEET.

DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.

DESIGN FILLS ARE MEASURED FROM THE TOP OF TOP SLAB TO THE TOP OF EARTH FILL OR ROADWAY.

CULVERTS MEET STRENGTH AND SERVICEABILITY REQUIREMENTS FOR THE DESIGN VEHICULAR LIVE LOAD HL-93 MINUS THE LANE LOAD.



MISSOURI HIGHWAYS AND TRANSPORTATION

COMMISSION 105 WEST CAPITOL

JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)



CONCRETE TRIPLE BOX CULVERT

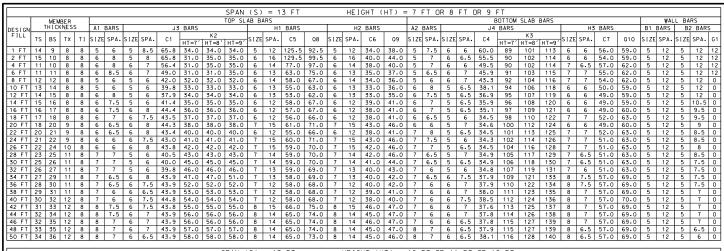
MEMBER THICKNESS BAR SIZE. SPACING & DIMENSIONS

SPAN (S): 12 FEET HEIGHT (HT): 12 THRU 15 FEET

DATE EFFECTIVE: DATE PREPARED: 9/29/2011

703.87

SHEET NO. 19 OF 27



												SPAN			3 FT			HE I G	HT (H	IT) =	10 1	FT O	R 11	1 FT		2 FT											
		MEM										TOP SL	AB B													MOTTO	SLAB I	BARS							L BAR		
DESIGN		THICE	(NES:	S	A1	BARS			J	BARS				Н	1 BARS			H2	BARS		A2	BARS			J4	BARS				Н3	BARS		B1 6	BARS	B2	BARS	
FILL	TS	BS	ТX	ΤI	SIZE	SPA.	SIZE	SPA.	C1	HT=10	K2 'HT=11	'HT=12	, S I ZE	SPA.	C5	08	SIZE	SPA.	C6	09	SIZE	SPA.	SIZE	SPA.	C4	HT=10'	K3 HT=11	HT=121	SIZE	SPA.	C7	010	SIZE	SPA.	SIZE	SPA.	G1
1 FT	14	10	9	10	5	6	5	7	66.6	34.0	34.0	34.0	5	12	126.5	93.5	5	12	35.0	38.0	5	7	6	6	81.5	126	138	150	6	6.5	57.0	60.0	5	12	5	9	12
2 FT	15	10	10	10	6	8	5	7.5	67.3	35.0	35.0	35.0	6	16	130.5	100.5	6	16	41.0	44.0	5	7	6	6	70.1	126	138	150	6	9	56.0	58.0	5	12	5	9.5	12
4 FT	11	10	10	10	6	8	5	6	72.3	31.0	31.0	31.0	6	15	82.0	97.0	6	15	38.0	39.0	5	7	6	6	64.6	126	138	150	7	6.5	58.0	61.0	5	9.5	5	9	12
6 FT	11	11	10	10	5	6	5	6	60.5	31.0	31.0	31.0	6	14	64.0	71.0	6	14	36.0	37.0	5	6.5	6	6	61.0	127	139	151	7	6.5	57.0	61.0	5	12	5	9	12
8 FT	12			10	5	6	5	6	56.8	32.0	32.0	32.0	6	14	60.0	64.0	6	14	35.0	36.0	5	6	6	6.5	59.1	129	141	153	6	6	52.0	59.0	5	12	5	8.5	0
10 FT	13	14	10	10	5	6	6	7	56.9			37.0	6	13	57.0	62.0	6	13	34.0	36.0	6	8	6	6.5	56.8	130	142	154	6	6	51.0	59.0	5	12	5	8	0
12 FT	14	15	10	10	5	6	6	6.5	54.6	34.0			6	13	55.0	61.0	6	13	34.0	36.0	6	7.5	6	6.5	54.9		143	155	6	6	51.0	59.0	5	12	5	8	0
14 FT	15	16	10	10	6	8	6	6.5	58.9		35.0		6	13	60.0	66.0	6	13		42.0	6	7	6	6	53.5		144	156	6	6	50.0	59.0	5	12	5	8	0
16 FT	16	17	11	10	6	7.5	6	7	58.0	36.0	36.0	40.0	6	12	58.0	66.0	6	12	39.0	42.0	6	7	6	7.5	52.5	133	145	157	6	6	50.0	59.0	5	12	5	7.5	0
18 FT	17	18	12	10	6	7.5	6	7	57.9	37.0			6	12	58.0	66.0	6	12	39.0	42.0	6	6	6	7.5	52.0		146	158	7	7	53.0	62.0	5	12	5	7	0
20 FT	18	20	12	10	6	7	6	6.5	57.3	38.0			6	12	57.0	65.0	6	12	39.0	42.0	6	6	6	7.5	51.5		148	160	6	6	50.0	60.0	5	12	5	7	0
22 FT	19	21	12	10	6	6	6	6.5	56.8	39.0	39.0		7	15	62.0	70.0	7	15	44.0	47.0	7	8	6	7	51.0	137	149	161	7	7	53.0	63.0	5	12	5	7	0
24 FT	21	22	13	10	6	6	6	6.5	56.9	41.0			6	12	56.0	65.0	6	12	38.0	42.0	7	7	6	7.5	51.1	138	150	162	7	7	53.0	63.0	5	12		6.5	0
26 FT			13	10	6	6	6	6.5	56.6	42.0			7	15	60.0	70.0	7	15		46.0	7	7	6	7.5	50.9		152	164	7	7	53.0	63.0	5	12	5	6.5	0
28 FT			14	10	7	7.5	6	6.5	57.0	43.0			7	15	60.0	69.0	7	15	43.0	46.0	7	6.5	6	8	51.0		153	165		6.5	53.0	63.0	5	12	5	6	0
30 FT			14	10	7	7	6	6.5	56.6	44.0			7	14	60.0	69.0	7	14	42.0	45.0	7	6.5	6	7.5	50.8	142	154	166	7	6.5	53.0	63.0	5	12	5		0
32 FT			14	10	7	7	6	6	56.5		46.0		7	13	59.0	69.0	7	13		43.0	7	6.5	6	7.5	50.8	144	156	168	7	6	53.0	63.0	5	12	5		0
34 FT			15		7	6.5	6	6.5	57.1	51.0			7	13	59.0	68.0	7	13	40.0	43.0	7	6.5	6	8	51.1	145	157	169		7.5	59.0	70.0	5	12	6		0
36 FT			15		7	6.5	6	6	57.1	52.0			7	12	59.0	68.0	7	12	40.0	42.0	7	6	6	7.5	51.1	146	158	170		7.5	59.0	70.0	5	12	6		0
38 FT	29		16	10	7	6	6	6	57.8	53.0	53.0	53.0	7	12	59.0	68.0	7	12		41.0	7	6	6	7.5	51.6	147	159	171	8	7	59.0	70.0	5	12	6	8	0
40 FT			16		7	6	6	6	57.8	54.0			7	12	59.0	67.0	7	12	39.0	40.0	7	6	6	7.5	51.6	148	160	172	8	7	59.0	70.0	5	12	6		0
42 FT			17	10	7	6	6	6	58.5			54.0	7	12	59.0	67.0	7	12	40.0	41.0	7	6	6	7	51.9		161	173	8	7	59.0	70.0	5	12			0
44 FT			17	10	8	7.5	6	6	57.4	55.0			8	15	66.0	74.0		15	47.0	48.0	7	6	6	7	50.8	150	162	174	8	7	59.0	70.0	5	12		7.5	0
46 FT			17	10	8	7.5	6	6	57.4	56.0			8	14	66.0	74.0	8	14	46.0	48.0	8	7.5	6	6.5	50.9		163	175	8	7	59.0	70.0	5	12			0
48 FT				10	8	7	6	6	57.4			57.0	8	14	66.0	73.0	8	14	46.0	47.0	8	7.5	6	6.5	51.1	152	164	176			59.0	70.0	5	12			0
50 FT	34	36	18	10	8	7	6	6	58.1		58.0	58.0	8	14	66.0	73.0	8	14	46.0	47.0	8	6.5	6	6.5	51.5	152	164	176	8	6.5	59.0	70.0	5	12	6	7	0
							C5	5		08																											

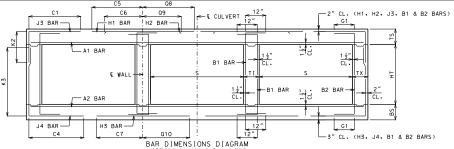


FIGURE NOTICES BETWEEN TABULATED DESIGN FILLS. USE THE NET PER PROPERTY OF THE PROPERTY OF THE

SPECIAL DESIGNS ARE REQUIRED WHEN THE DESIGN FILL IS LESS THAN 1 FOOT OR GREATER THAN 50 FEET.

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CULVERTS MEET STRENGTH AND SERVICEABILITY REQUIREMENTS FOR THE DESIGN VEHICULAR LIVE LOAD HL-93 MINUS THE LANE LOAD.



MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)

CONCRETE



TRIPLE BOX CULVERT

MEMBER THICKNESS BAR SIZE. SPACING & DIMENSIONS

SPAN (S): 13 FEET HEIGHT (HT): 7 THRU 12 FEET

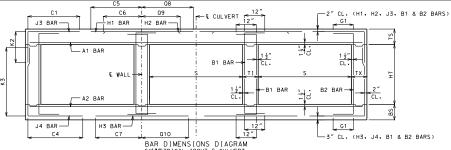
DATE EFFECTIVE: DATE PREPARED:

9/29/2011

703.87

SHEET NO. 20 OF 27

											SF	PAN	(S)	= 13	FT			HE I GH	IT (HI	Γ) =	15	FT (OR 1	6 FT											
		MEME										TOP S	SLAB I	BARS										Е	BOTTOM	SLAB I	BARS					WAL	L BAF	२ऽ	
DESIGN	T	HICK	NESS		A1	BARS			J3	BARS			H1	BARS			H2	BARS		A2	BARS			J4	BARS			Н3	BARS		B1 I	BARS	B2	BARS	Ś
FILL	TS	BS	тх	ΤI	SIZE	SPA.	SIZE	SPA.	C1	HT=15'	2 HT=16'	SIZE	SPA.	C5	08	SIZE	SPA.	C6	09	SIZE	SPA.	SIZE	SPA.	C4	HT=15		SIZE	SPA.	C7	010	SIZE	SPA.	SIZE	SPA.	G1
1 FT	14	11	12	13	5	6	5	6	69.0	34.0	34.0	5	12	128.5	95.5	5	12	35.0	37.0	5	6.5	6	6.5	103.3	187	199	6	7	60.0	61.0	5	10.5	5	7	12
2 FT	15	11	12	13	6	8	6	8	72.0	35.0	39.0	6	16	135.5	102.5	6	16	41.0	44.0	5	6.5	6	6	95.4	187	199	6	6.5	58.0	59.0	5	12	5	7	12
4 FT	11	11	12	13	9	8	6	7	72.0	35.0	35.0	6	15	130.5	82.0	6	15	39.0	39.0	5	6.5	7	6	92.5	187	199	6	6	57.0	59.0	5	12	5	6.5	12
6 FT	11	12	12	13	5	6	6	6.5	90.4	35.0	35.0	6	14	65.0	66.0	6	14	37.0	37.0	5	6	7	6	88.9	188	200	6	6	56.0	59.0	5	12	5	6.5	12
8 FT	11	13	13	13	5	6	6	6.5	78.1	35.0	35.0	6	13	60.0	62.0	6	13	36.0	36.0	5	6	6	6	82.4	189	201	6	6	55.0	59.0	5	12	5	6.5	0
10 FT	12	14	13	13	5	6	6	6.5	76.0	36.0	36.0	6	13	58.0	60.0	6	13	35.0	36.0	6	8	6	6	80.4	190	202	6	6	54.0	59.0	5	12	5	6	0
12 FT	13	15	14	13	5	6	6	6.5	73.3		37.0	6	12	57.0	59.0	6	12	35.0	36.0	6	7.5	6	6	77.5	191	203	6	6	53.0	59.0	5	12	5	6	0
14 FT	14	16	14	13	6	8	6	6	72.3		38.0	6	12	55.0	59.0	6	12	35.0	36.0	6	7	6	6	76.3	192	204	7	7	55.0	62.0	5	12	5	6	0
16 FT	15	17	16	13	6	7.5	6	6.5	76.6		39.0	6	12	60.0	64.0	6	12	41.0	42.0	6	6.5	6	6.5	73.3	193	205	7	7	55.0	62.0	5	12	6	8	0
18 FT	16	19	16	13	6	7	6	6	76.3	40.0	40.0	6	12	59.0	64.0	6	12	40.0	42.0	6	6	6	6	74.1	195	207	6	6	52.0	60.0	5	12	6	8	0
20 FT	18	20	16	13	6	7	6	6	76.8	42.0	42.0	6	12	59.0	64.0	6	12	40.0	42.0	6	6	6	6	73.0	196	208	6	6	52.0	60.0	5	12	6	8	0
22 FT	19	21	17	13	6	6.5	6	6	76.4	43.0	43.0	6	12	58.0	64.0	6	12	40.0	42.0	7	7.5	7	7.5	75.1	197	209	7	7	55.0	63.0	5	12	6	7.5	0
24 FT	20	23	17	13	6	6.5	7	7.5	81.1	44.0	50.0	6	12	58.0	64.0	6	12	40.0	42.0	7	7	7	7	75.4	199	211	7	7	55.0	63.0	5	12	6	7.5	0
		24	18	13	6	6	7	7.5	81.5		52.0	7	15	62.0	69.0	7	15	44.0	46.0	7	7	7	7.5	74.9	200	212	7	7	55.0	63.0	5	12	6	7	0
	23	25	18	13	7	7.5	7	6.5	81.3		53.0	7	15	62.0	69.0	7	15	43.0	46.0	7	6.5	7	6.5	74.6	201	213	7	6.5	55.0	63.0	5	12	6	7	0
	24	26	19	13	7	7.5	7	7	81.3		54.0	7	14	61.0	69.0	7	14	43.0	46.0	7	6.5	7	7	74.4	202	214	7	6.5	55.0	63.0	5	12		6.5	0
	25	28	20	13	7	7	7	7	81.4	49.0	55.0	7	14	61.0	68.0	7	14	42.0	45.0	7	6.5	7	7.5	74.6	204	216	7	6	55.0	64.0	5	12	6	6.5	0
34 FT	26	29	21	13	7	7	7	7	81.6	50.0	56.0	7	13	61.0	68.0	7	13	42.0	44.0	7	6.5	7	7.5	74.5	205	217	8	7.5	61.0	70.0	5	12	6	6	0
		30	22	13	7	6.5	7	7		57.0	57.0	7	13	60.0	68.0	7	13	42.0	44.0	7	6	7	7.5	74.8	206	218	8	7.5	61.0	70.0	5	12	6	6	0
	28	31		13	7	6.5	7	6.5	82.1	58.0	58.0	7	12	60.0	67.0	7	12	41.0	43.0	7	6	7	7	74.8	207	219	8	7	61.0	70.0	5	12	6	6	0
	29		23	13	7	6	7	6.5	82.6		59.0	7	12	60.0	67.0	7	12	41.0	42.0	7	6	7	7	75.0	208	220	8	7	61.0	70.0	5	12		7.5	0
			24	13	7	6	7	6.5	83.3		60.0	7	12	60.0	66.0	7	12	40.0	42.0	7	6	7	7	75.3	209	221	8	7	61.0	70.0	5	12		7.5	0
				13	7	6	7	7	81.8		61.0	8	15	68.0	74.0	8	15	47.0	49.0	7	6	7	7	73.5	210	222	8	7	61.0	70.0	5	12	7	7.5	0
46 FT	31	35	24	13	8	7.5	7	6	81.6		61.0	8	15	68.0	74.0	8	15	48.0	49.0	8	7.5	7	7	73.8	211	223	8	7	61.0	70.0	5	12	7	7.5	0
			25	13	8	7.5	7	6	82.4	62.0	62.0	8	14	67.0	73.0	8	14	47.0	49.0	8	7.5	7	7	74.1	212	224	8	6.5	61.0	71.0	5	12		7.5	0
50 FT	33	37	26	13	8	7	7	6	83.1	63.0	63.0	8	14	67.0	72.0	8	14	47.0	48.0	8	7.5	7	6.5	74.5	213	225	8	6.5	61.0	71.0	5	12	_7	7.5	0
							C.F	5		08																									



IF DESIGN FILL IS BETWEEN TABULATED DESIGN FILLS. USE THE VERY GERATA NABULET DESIGN FIAL. ELECT TO THE DESIGN FILLS WEEN 2 FEBRUARY OF THE TOTAL OF THE THE TABULATED BETWEEN 2 FEET AND 4 FERE USE THE GREATER MEMBER THICKNESS. AREA OF REINFORCEMENT AND BAR DIMENSIONS FROM THE 2 FEET AND 4 FEET TABULATED DESIGN FILLS. AREA OF REINFORCEMENT EQUALS BAR AREA PER FOOT SPACING.

SPECIAL DESIGNS ARE REQUIRED WHEN THE DESIGN FILL IS LESS THAN 1 FOOT OR GREATER THAN 50 FEET.

DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.

DESIGN FILLS ARE MEASURED FROM THE TOP OF TOP SLAB TO THE TOP OF EARTH FILL OR ROADWAY.

CULVERTS MEET STRENGTH AND SERVICEABILITY REQUIREMENTS FOR THE DESIGN VEHICULAR LIVE LOAD HL-93 MINUS THE LANE LOAD.



MISSOURI HIGHWAYS AND TRANSPORTATION

COMMISSION 105 WEST CAPITOL

JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)



CONCRETE TRIPLE BOX CULVERT

MEMBER THICKNESS
BAR SIZE, SPACING & DIMENSIONS

SPAN (S): 13 FEET HEIGHT (HT): 13 THRU 16 FEET

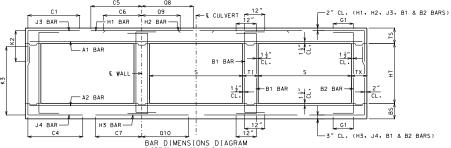
DATE EFFECTIVE: DATE PREPARED: 9/29/2011

703.87

.87 SHEET NO. 21 OF 27

IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICAL

											Ş	SPAN (S)	= 14	FT			HE I G	нт (н	T) =	10 F	T O	₹ 11	FΤ	OR 1	2 FT											
		MEME	ER									TOP SL	AB B													BOTTOM	SLAB I	BARS					-		L BAF		
DESIGN		HICK	VESS	Α	.1 BA	ARS			J3	BARS				H1	BARS			H2	BARS		A2 I	BARS			J4	BARS				Н3	BARS		B1 F	BARS	B2	BARS	
FILL	TS	вѕ	тх	TI SI	ZE S	PA.	SIZE	SPA.	C1	HT=10'	K2 HT=11	HT=12	SIZE	SPA.	C5	08	SIZE	SPA.	C6	09	SIZE	SPA.	SIZE	SPA.	C4	HT=101	K3 HT=11'	HT=121	SIZE	SPA.	C7	010	SIZE	SPA.	SIZE	SPA.	G1
1 FT	14	10	9	10	6 8	3.5	5	7	70.3	34.0	34.0	34.0	5	12	134.5	99.5	5	12	39.0	43.0	5	7	6	6	80.1	126	138	150	6	6	60.0	63.0	5	10.5	5	9	12
2 FT	15	11	9	10	6	8	5	7	70.3	35.0	35.0	35.0	6	16	138.5	106.5	6	16	45.0	48.0	5	6.5	6	6	73.6	127	139	151	6	6.5	59.0	62.0	5	12	5	9	12
4 FT	11	11	11	10	6	7	5	6	66.6	31.0	31.0	31.0	6	13	81.0	94.0	6	13	39.0	40.0	5	6.5	5	6	61.8	127	139	151	7	7	61.0	65.0	5	9.5	5	10	12
6 FT	12	12	11	10	6	8	5	6.5	60.6	32.0	32.0	32.0	6	13	67.0	75.0	6	13	37.0	39.0	5	6	5	6	57.3	128	140	152	7	7	59.0	65.0	5	12	5	10.5	12
8 FT	12	13	11	10	6	8	5	6	56.3	32.0	32.0	32.0	6	12	62.0	67.0	6	12	36.0	37.0	5	6	6	7	57.4	129	141	153	7	6.5	57.0	65.0	5	12	5	10	0
10 FT	13	14	11	10	6 7	7.5	6	8	56.3	33.0	33.0	37.0	6	12	59.0	65.0	6	12	35.0	37.0	6	7.5	6	7	55.0	130	142	154	7	6.5	57.0	65.0	5	12	5	9.5	0
12 FT	14	16	12	10	6 7	7.5	6	8	54.9	34.0	34.0	34.0	7	15	61.0	67.0	7	15	38.0	39.0	6	7	5	6	50.9	132	144	156	7	7	56.0	66.0	5	12	5	9.5	0
14 FT	16	17	12	10	6 7	7.5	6	8	59.3	36.0	36.0	36.0	6	12	62.0	70.0	6	12	41.0	43.0	6	7	5	6	49.9	133	145	157	7	7	56.0	66.0	5	12	5	9	0
16 FT	17	18	12	10	6	7	6	7.5	58.1	37.0		41.0	7	16	66.0	74.0	7	16	45.0	48.0	6	6.5	6	8	52.0	134	146	158	7	7	56.0	66.0	5	12	5	8	0
		20	12	10	6	7	6	7	57.5	38.0		42.0	7	15	65.0	74.0	7	15	45.0	48.0	6	6	6	8	51.3	136	148	160	7	7	55.0	66.0	5	12	5	7.5	0
			12	10	6	6	6	6.5	56.6	39.0		43.0	7	14	64.0	74.0	7	14	45.0	48.0	7	8	6	7.5	50.6	137	149	161	7	7	55.0	66.0	5	12	5	7	0
			12	10	6	6	6	6.5	55.9	41.0		45.0	7	15	64.0	74.0	7	15	45.0	48.0	7	7	6	6.5	50.3	138	150	162	7	7	55.0	66.0	5	12	5	7	0
					6	6	6	6.5	56.4	42.0		46.0	7	14	63.0	73.0	7	14	44.0	48.0	7	7	6	7.5	50.4	140	152	164	7	7	55.0	67.0	5	12		6.5	0
				10	7	7		6.5	56.6	43.0		47.0	7	14	63.0	73.0	7	14	44.0	48.0	7	6.5	6	8	50.4	141	153	165	7	6.5	55.0	67.0	5	12		6.5	0
				10	7	7	_	6.5	56.4	45.0			7	14	62.0	73.0	7	14	43.0	47.0	7	6.5	6	8	50.3	143	155	167	7	6	55.0	67.0	5	12	5	6	0
				10	7	7		6.5	56.0	46.0		50.0	7	13	62.0	73.0	7	13	43.0	47.0	7	6	6	7.5	50.0	144	156	168	7	6	55.0	67.0	5	12	5	6	0
				10	7	6	6	6	55.6		51.0	51.0	7	12	62.0	72.0	7	12	43.0	46.0	7	6		7.5	49.8	145	157	169	8	7.5	61.0	73.0	5	12	5	6	0
			-	10	7	6	6	6.5	56.3	53.0		53.0	7	12	61.0	72.0	7	12	41.0	44.0	7	6			50.3	147	159	171	8	7	61.0	73.0	5	12	6	8	0
				10	7	6	6	6	56.1	54.0		54.0	7	12	61.0	71.0	7	12	41.0	43.0	8	7.5	6	7.5	50.3	148	160	172	8	7	61.0	73.0	5	12	6	8	0
	31			10	8 7	7.5	6	6	56.9	55.0		55.0	8	15	69.0	79.0	8	15	49.0	51.0	8	7.5	6	7	50.6	149	161	173	8		61.0	73.0	5	12	6	8	0
				10	,	7.5	6	6	56.9	56.0	56.0	56.0	8	14	69.0	78.0	8	14	48.0	50.0	8	7	6	7	50.6	150	162	174	8	6.5	61.0	73.0	5	12	6	8	0
				10	_		6	6	56.9	57.0		57.0	8	14	69.0	78.0	8	14	48.0	49.0	8			6.5	50.8	151	163	175	8	6.5	61.0	73.0	5	12	6	8	0
	34			10	_	1	6	6	57.6	58.0		58.0	8	14	68.0	77.0	8	14	47.0	49.0	8				51.3	152	164	176	8	6	61.0	73.0	5	12		7.5	0
46 FT						5.5	6	6	56.5	59.0		59.0	8	13	68.0	77.0	8	13	47.0	48.0	8			6.5	50.1	153	165	177	8	6	61.0	73.0	5	12			0
	35			10		5.5	6	6	56.5	59.0		59.0	8	13	68.0	77.0	8	13	47.0	49.0	8	/	6	6	50.1	154	166	178	8	6	61.0	73.0	5	12		7.5	0
50 FT	36	59	17	10	8 E	5.5	7 C5	7.5	61.6	0.0 08	60.0	60.0	8	13	68.0	76.0	8	13	47.0	48.0	8	6.5	6	6	50.3	155	167	179	8	6	61.0	73.0	_ 5	12	6	7.5	0



THE DESIGN FILL IS BETWEEN TABULATED DESIGN FILLS. USE THE NET PER THE PROPERTY ABOUT THE PROPERTY OF THE PROPERTY ABOUT THE PROPERTY OF THE PROPERTY ABOUT THE PROPERTY OF THE PROPERTY ABOUT THE OFFICE AND A FEW USE THE OFFICE AND THE PROPERTY ABOUT THE PROPERTY OF THE

SPECIAL DESIGNS ARE REQUIRED WHEN THE DESIGN FILL IS LESS THAN 1 FOOT OR GREATER THAN 50 FEET.

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CULVERTS MEET STRENGTH AND SERVICEABILITY REQUIREMENTS FOR THE DESIGN VEHICULAR LIVE LOAD HL-93 MINUS THE LANE LOAD.



MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)



CONCRETE TRIPLE BOX CULVERT

MEMBER THICKNESS BAR SIZE. SPACING & DIMENSIONS

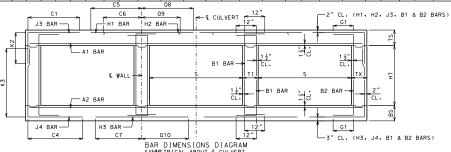
SPAN (S): 14 FEET HEIGHT (HT): 7 THRU 12 FEET

DATE EFFECTIVE: DATE PREPARED: 9/29/2011

703.87

SHEET NO. 22 OF 27

		MEM										TOP :	SLAB I	BARS										Е	BOTTOM	SLAB 8	BARS					₩AL	L BA	RS	
DESIGN	T	LHICH	NESS	5	Α1	BARS			J3	BARS			H1	BARS			Н2	BARS		Α2	BARS			J4	BARS			Н3	BARS		B1 I	BARS	B2	BAR:	ŝ
FILL	TS	BS	ТX	ΤI	SIZE	SPA.	SIZE	SPA.	C1	HT=15'	2 HT=16'	SIZE	SPA.	C5	08	SIZE	SPA.	C6	09	SIZE	SPA.	SIZE	SPA.	C4	HT=151		SIZE	SPA.	C7	010	SIZE	SPA.	SIZE	SPA.	G1
1 FT	14	11	12	13	5	6	5	6	72.6	34.0	34.0	5	12	136.5		5	12	38.0	41.0	5	6.5	6	6	103.4		199	6	6.5	62.0	63.0	5	11.5	5	7	12
2 FT	15	12	12	13	6	8	6	8	75.6	35.0	39.0	6	16	143.5		6	16	45.0	48.0	5	6	6	6.5	99.0	188	200	6	6.5	61.0	63.0	5	12	5	7	12
4 FT	12	12	12	13	6	8	6	7.5	75.6	36.0	36.0	6	15	138.5	89.0	6	15	40.0	41.0	5	6	6	6	90.1	188	200	6	6	60.0	63.0	5	12	5	7	12
6 FT	12	13	12	13	6	8	6	7	89.3	36.0	36.0	6	14	69.0	71.0	6	14	38.0	39.0	5	6	6	6	86.4	189	201	6	6	58.0	63.0	5	12	5	6.5	12
8 FT	12	14	13	13	6	8	6	6.5	78.1	36.0	36.0	6	12	64.0	66.0	6	12	37.0	37.0	6	8	6	6	81.9		202	6	6	57.0	62.0	5	12	5	6.5	0
10 FT	13	15	13	13	6	8	6	6.5	75.1	37.0	37.0	6	12	61.0	64.0	6	12	37.0	37.0	6	7.5	6	6.5	79.1	191	203	7	7	59.0	65.0	5	12	5	6.5	0
12 FT	14	16	14	13	6	7.5	6	6.5	72.9	38.0	38.0	6	12	59.0	63.0	6	12	36.0	37.0	6	7	6	6.5	75.6	192	204	7	7	58.0	65.0	5	12	5	6	0
14 FT	15	17	15	13	6	7.5	6	6.5	77.6	39.0	39.0	7	16	69.0	73.0	7	16	47.0	48.0	6	7	6	6.5	73.6		205	7	7	58.0	65.0	5	12	6	8	0
16 FT	17	19	15	13	6	7.5	6	6	77.6	41.0	41.0	6	12	63.0	68.0	6	12	42.0	44.0	6	6	6	6	73.5		207	6	6	55.0	63.0	5	12	6	8	0
18 FT	18	20	15	13	6	7	7	7.5	81.8	42.0	48.0	7	16	67.0	73.0	7	16	46.0	49.0	6	6	7	7	75.6	196	208	7	7	57.0	66.0	5	12	6	8	0
20 FT	19	21	16	13	6	6.5	7	7.5	81.1	43.0	49.0	7	15	66.0	73.0	7	15	46.0	49.0	7	7.5	7	7.5	74.8	197	209	7	7	57.0	66.0	5	12	6	8	0
	20	23	17	13	6	6	7	7.5	80.8	44.0	50.0	7	15	65.0	73.0	7	15	46.0	49.0	7	7	7	7.5	74.6		211	7	7	57.0	66.0	5	12	6	7.5	0
	22	24	17	13	6	6	7	7	80.8	46.0	52.0	7	15	65.0	73.0	7	15	46.0	49.0	7	7	7	7	74.1	200	212	7	7	57.0	66.0	5	12	6	7.5	
	23	25	18	13	7	7.5	7	7	80.5	47.0	53.0	7	15	65.0	72.0	7	15	46.0	49.0	7	6	7	7.5	73.6		213	7	6	57.0	67.0	5	12	6	7	0
	24	27	19	13	7	7.5	7	7	80.5	48.0	54.0	7	14	64.0	72.0	7	14	45.0	48.0	7	6.5	7	8	73.8	203	215	7	6	57.0	67.0	5	12	6	6.5	0
	25	28	20	13	7	6.5	7	7	80.6	49.0	55.0	7	13	64.0	72.0	7	13	45.0	48.0	7	6	7	8	73.5		216	7	6	57.0	67.0	5	12	6	6.5	
32 FT	27	30	21	13	7	6.5	7	7	81.1	51.0	51.0	7	13	63.0	71.0	7	13	43.0	46.0	7	6	6	6	70.8	206	218	8	7.5	63.0	73.0	5	12	6	- 6	0
34 FT	28	31	21	13	7	6.5	7	7	80.9	52.0	52.0	7	12	63.0	71.0	7	12	43.0	46.0	7	6	6	6	70.4	207	219	8	7	63.0	73.0	5	12	6	- 6	0
	29	32	22	13	7	6	7	7	81.1	59.0	59.0	7	12	63.0	71.0	7	12	43.0	45.0	8	7.5	7	7.5	73.3		220	8	7	63.0	73.0	5	12	6	6	0
	30	33	22	13	7	6	7	6	81.1	60.0	60.0	7	12	63.0	71.0	7	12	42.0	45.0	8	7.5	7	7	73.4	209	221	8	6.5	63.0	74.0	5	12	6	6	0
40 FT	31	34	23	13	8	7.5	7	6.5	81.8	61.0	61.0	8	15	70.0	78.0	8	15	50.0	52.0	8	7	7	7.5	73.5	210	222	8	6.5	63.0	74.0	5	12	7	7.5	0
	32	35	24	13	8	7.5	7	6.5	82.3	62.0	62.0	8	14	70.0	78.0	8	14	49.0	51.0	8	6.5	7	7	73.8	211	223	8	6.5	63.0	74.0	5	12	7	7.5	0
		36	24	13	8	7	7	6	82.4	63.0	63.0	8	14	70.0	77.0	8	14	49.0	50.0	8	6.5	7	7	73.9	212	224	8	6	63.0	74.0	5	12	7	7.5	0
	34	38	26	13	8	7	1 7	6	83.8	64.0	64.0	8	14	70.0	76.0	8	14	48.0	49.0	8	7	7	7	74.6		226	8	6.5	63.0	74.0	5	12	7	7.5	0
	35	38	26	13	8	6.5	17	6.5	82.1	65.0	65.0	8	13	69.0	76.0	8	13	48.0	49.0	8	6.5	7	7	72.6	214	226	8	6	63.0	74.0	5	12	7	- 8	0
50 FT	35	39	26	13	8	6.5	7 C!	6	82.1	65.0	65.0	8	13	69.0	76.0	8	13	48.0	50.0	8	6.5	- 7	6.5	72.8	215	227	8	6	63.0	74.0	5	12	1	7.5	0



IF DESIGN FILL IS BETWEEN TABLLATED DESIGN FILLS. USE THE NETH FOREY TO A SUBSTITUTE OF THE NETH PROPERTY OF THE N

SPECIAL DESIGNS ARE REQUIRED WHEN THE DESIGN FILL IS LESS THAN 1 FOOT OR GREATER THAN 50 FEET.

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DESIGN FILLS ARE MEASURED FROM THE TOP OF TOP SLAB TO THE TOP OF EARTH FILL OR ROADWAY.

CULVERTS MEET STRENGTH AND SERVICEABILITY REQUIREMENTS FOR THE DESIGN VEHICULAR LIVE LOAD HL-93 MINUS THE LANE LOAD.



MISSOURI HIGHWAYS AND TRANSPORTATION

COMMISSION 105 WEST CAPITOL

JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)



CONCRETE TRIPLE BOX CULVERT

MEMBER THICKNESS BAR SIZE, SPACING & DIMENSIONS

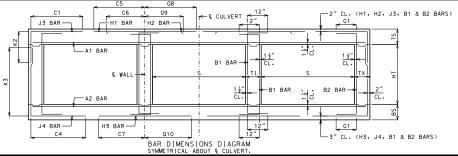
SPAN (S): 14 FEET HEIGHT (HT): 13 THRU 16 FEET

DATE EFFECTIVE: DATE PREPARED: 12/01/2011 9/29/2011 703.87

SHEET NO. 23 OF 27 IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECT

XT EN 2 USE

															FΤ			HE I G	нт (н	T) =	11	FT O	R 12	PT.		3 FT							_				
		MEME THICK		.			_					TOP SL	AB BA								ļ.,					BOTTOM	SLAB E	BARS	_				L-		L BA		_
DESIGN		HICK	NE 53	`	A1 B	ARS	_		J3	BARS			_	H1	BARS		<u> </u>	H2	BARS		A2	BARS	_		J4	BARS				НЗ	BARS		B1	BARS	<u> </u>	2 BARS	_
FILL	TS	BS	ТХ	TI S	IZE:	SPA.	SIZE	SPA.	C1	HT=11	K2 HT=12	HT=13′	SIZE	SPA.	C5	08	SIZE	SPA.	C6	09	SIZE	SPA.	SIZE	SPA.	C4	HT=11'	K3 HT=121	HT=13′	SIZE	SPA.	C7	010	SIZE	SPA.	SIZE	SPA.	G1
1 FT	15	11	9	10	6	8	5	6.5	73.9	35.0	35.0	35.0	6	16	147.5	112.5	6	16	48.0	52.0	5	6.5	6	6	89.3	139	151	163	6	6.5	63.0	67.0	5	12	5	8.5	12
2 FT	15	11	10	10	6	7.5	5	6.5	74.5	35.0	35.0	35.0	6	16	147.5	112.5	6	16	49.0	53.0	5	6.5	6	6	77.1	139	151	163	6	6	61.0	65.0	5	12	5	8	12
4 FT	12	12	10	10	6	7	6	7.5	77.5	32.0	36.0	36.0	6	13	89.0	107.0	6	13	41.0	43.0	5	6	6	6.5	71.3	140	152	164	6	6	60.0	67.0	5	10	5	8	12
6 FT	12	12	10	10	6	7	6	7	67.9	32.0	36.0	36.0	7	16	74.0	83.0	7	16	41.0	43.0	6	8	6	6	65.1	140	152	164	7	6	61.0	68.0	5	12	5	8	12
8 FT	13	14	10	10	6	7.5	6	6.5	63.0	33.0	37.0	37.0	7	16	69.0	75.0	7	16	40.0	42.0	6	7.5	6	6	62.3	142	154	166	7	6.5	60.0	69.0	5	12	5	8	0
10 FT	14	15	10	10	6	7	6	6.5	59.4	34.0	38.0	38.0	7	15	66.0	73.0	7	15	40.0	42.0	6	7	7	6.5	62.4	143	155	167	7	6.5	59.0	69.0	5	12	5	8	0
12 FT	15	17	11	10	6	7	6	6.5	63.5	35.0	35.0	39.0	7	14	71.0	79.0	7	14	47.0	49.0	6	7	6	7	57.5	145	157	169	7	7	59.0	69.0	5	12	5	7.5	0
14 FT	17	18	12	10	6	7	6	6.5	62.4	37.0	41.0	41.0	7	15	70.0	78.0	7	15	47.0	49.0	6	6.5	6	7	56.4	146	158	170	7	6.5	58.0	69.0	5	12	5	7	0
16 FT	18	19	12	10	6	6.5	6	6.5	61.1	38.0	42.0	42.0	7	14	68.0	78.0	7	14	46.0	49.0	6	6	6	7	55.4	147	159	171	7	6.5	58.0	69.0	5	12	5	7	0
18 FT	19	21	12	10	6	6	6	6	60.4	39.0	43.0	43.0	7	14	68.0	77.0	7	14	46.0	49.0	7	8	6	6	54.6	149	161	173	7	6.5	58.0	70.0	5	12	5	7	0
20 FT	21	22	13	10	6	6	6	6	60.3	41.0	45.0	45.0	7	14	67.0	77.0	7	14	46.0	49.0	7	7	6	6.5	54.5	150	162	174	7	6.5	58.0	70.0	5	12	5	6.5	0
22 FT	22	24	13	10	6	6	6	6	59.6	42.0	46.0	46.0	7	14	66.0	77.0	7	14	46.0	49.0	7	7	6	6.5	54.0	152	164	176	7	6.5	58.0	70.0	5	12	5	6.5	0
24 FT		25	14	10	7	7.5	6	6	59.8	44.0		48.0	7	14	66.0	77.0	7	14	45.0	49.0	7	6.5	6	7	54.1	153	165	177	7	6.5	58.0	70.0	5	12	5	6	0
26 FT	25	27	14	10	7	7	6	6	59.5	45.0	49.0	49.0	7	13	65.0	76.0	7	13	45.0	49.0	7	6.5	6	7	53.8	155	167	179	7	6	58.0	70.0	5	12	5	6	0
28 FT	26	28	15	10	7	6.5	6	6	59.9	50.0	50.0	50.0	7	13	65.0	76.0	7	13	45.0	49.0	7	6	6	7	53.9	156	168	180	7	6	58.0	70.0	5	12	6	8	0
30 FT	28	30	15	10	7	6.5	7	8	64.5	52.0		52.0	7	12	64.0	76.0	7	12	44.0	47.0	8	7.5	6	7	53.8	158	170	182	8	7.5	64.0	76.0	5	12	6	8	0
32 FT	29	31	15	10	7	6	7	7	64.3	53.0		53.0	7	12	64.0	75.0	7	12	44.0	47.0	8	7.5	6	6.5	53.5	159	171	183	8	7	64.0	76.0	5	12	6	8	0
34 FT		32	16	10	8	7.5	6	6	59.6	55.0	55.0	55.0	8	15	72.0	83.0	8	15	50.0	53.0	8	6.5	6	7	53.8	160	172	184	8	6.5	64.0	76.0	5	12	6	8	0
36 FT		34	16	10	8	7.5	7	7	64.5	56.0		56.0	8	14	72.0	82.0	8	14	50.0	52.0	8	7	6	7	53.8	162	174	186	8	6.5	63.0	77.0	5	12	6	8	0
38 FT	33	35	17	10	8	7	7	7.5	65.1	57.0		57.0	8	14	71.0	82.0	8	14	49.0	52.0	8	7	6	6.5	54.0	163	175	187	8	6.5	63.0	77.0	5	12	6	7.5	0
40 FT	34	36	17	10	8	7	7	7	65.1	58.0	58.0	58.0	8	14	71.0	81.0	8	14	49.0	51.0	8	6.5	6	6.5	54.0	164	176	188	8	6	63.0	77.0	5	12	6	7.5	0
42 FT		37	18	10	-	6.5	7	7.5	65.9	59.0	59.0	59.0	8	13	71.0	80.0	8	13	49.0	50.0	8	6	6	6.5	54.4	165	177	189	8	6	64.0	77.0	5	12	6	7	0
44 FT	36	39	18	10	-	6.5	7	7	66.0	60.0		60.0	8	13	71.0	80.0	8	13	48.0	50.0	8	6.5	6	6	54.6	167	179	191	8	6	63.0	77.0		12	6	7	0
46 FT	37	40	19	10	8	6.5	7	7.5	66.8	61.0		61.0	8	12	70.0	79.0	8	12	48.0	49.0	8	6.5	6	6	55.0	168	180	192	9	7.5	70.0	83.0	5	12	6	6.5	0
48 FT	38		19	10	8	6	7	6.5	66.8	62.0	62.0	68.0	8	12	70.0	78.0	8	12	47.0	48.0	8	6.5	7	8	58.1	169	181	193	9	7	70.0	83.0	5	12	6	6.5	0
50 FT	39	42	19	10	8	6	7	7	65.6	63.0	63.0	69.0	8	12	70.0	77.0	8	12	47.0	48.0	8	6.5	7	7.5	57.0	170	182	194	9	7	69.0	83.0	5	12	6	6.5	0



IF DESIGN FILL IS BETWEEN TABULATED DESIGN FILLS. USE THE VERY GERATEN ABULETT DESIGN FILL LICEDET FOR DESIGN FILES AND A FER USE NEW 2 THE OFFICE THE STATE OF T

SPECIAL DESIGNS ARE REQUIRED WHEN THE DESIGN FILL IS LESS THAN 1 FOOT OR GREATER THAN 50 FEET.

DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.

DESIGN FILLS ARE MEASURED FROM THE TOP OF TOP SLAB TO THE TOP OF EARTH FILL OR ROADWAY.

CULVERTS MEET STRENGTH AND SERVICEABILITY REQUIREMENTS FOR THE DESIGN VEHICULAR LIVE LOAD HL-93 MINUS THE LANE LOAD.



MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)



CONCRETE TRIPLE BOX CULVERT

MEMBER THICKNESS BAR SIZE. SPACING & DIMENSIONS

SPAN (S): 15 FEET HEIGHT (HT): 8 THRU 13 FEET

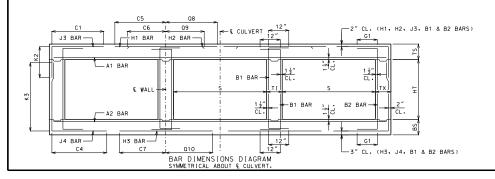
DATE EFFECTIVE: DATE PREPARED:

9/29/2011

703.87

SHEET NO. 24 OF 27

											_			= 15	FT			HE I G	нт (н	T) =	14	FT O	₹ 15	FT		6 FT											\Box
		MEM	BER									TOP SL	AB B	ARS											Е	MOTTO	SLAB I	BARS						₩AL	L BA	.RS	
DESIGN		THICK	NESS	5	A1 E	BARS			J3	BARS				H1	BARS			H2	BARS		A2	BARS			J4	BARS				Н3	BARS		B1	BARS	B2	2 BAR	5
FILL	TS	вѕ	тх	ΤI	SIZE	SPA.	SIZE	SPA.	C1	HT=14	K2 HT=15'	HT=16	SIZE	SPA.	C5	08	SIZE	SPA.	C6	09	SIZE	SPA.	SIZE	SPA.	C4	HT=141	K3 HT=15′	HT=16'	SIZE	SPA.	C7	010	SIZE	SPA.	SIZE	SPA.	G1
1 FT	15	11	12	13	6	8	6	8	79.3	35.0	35.0	39.0	6	16	152.5	114.5	6	16	48.0	51.0	5	6.5	6	6	99.0	175	187	199	6	6	64.0	65.0	5	11.5	5	7	12
2 FT	15	12	12	13	6	8	6	8	79.3	35.0	35.0	39.0	6	16	152.5	114.5	6	16	49.0	52.0	5	6	6	6.5	95.5	176	188	200	6	6	63.0	66.0	5	11.5	5	7	12
4 FT	12	12	12	13	6	7	6	7	111.5	36.0	36.0	36.0	6	13	99.0	91.0	6	13	41.0	42.0	5	6	6	6	88.6	176	188	200	7	6.5	65.0	69.0	5	9.5	5	7	12
6 FT	12	13	12	13	6	7.5	6	6.5	85.6	36.0	36.0	36.0	6	12	71.0	73.0	6	12	40.0	40.0	6	8	6	6	84.0	177	189	201	7	6.5	64.0	69.0	5	12	5	6.5	12
8 FT	13	14	13	13	6	7.5	6	7	77.4	37.0	37.0	37.0	6	12	67.0	70.0	6	12	38.0	39.0	6	7.5	6	6	78.1	178	190	202	7	6.5	62.0	68.0	5	12	5	6.5	0
10 FT	14	16	13	13	6	7.5	6	6	75.0	38.0	38.0	38.0	7	15	67.0	71.0	7	15	41.0	42.0	6	7	6	6	77.0	180	192	204	7	7	61.0	69.0	5	12	5	6.5	0
12 FT	15	17	14	13	6	7	6	6	78.9	39.0	39.0	39.0	7	15	73.0	78.0	7	15	48.0	50.0	6	7	6	6.5	74.8	181	193	205	7	6.5	60.0	69.0	5	12	5	6	0
14 FT	16	18	15	13	6	7	6	6	77.5	40.0	40.0	40.0	7	14	71.0	77.0	7	14	48.0	49.0	6	6.5	6	6.5	73.0	182	194	206	7	6.5	60.0	69.0	5	12	6	8	0
16 FT	18	20	15	13	6	7	7	8	81.9	42.0	42.0	42.0	7	15	70.0	77.0	7	15	48.0	50.0	6	6	6	6	72.4	184	196	208	7	7	60.0	69.0	5	12	6	8	0
18 FT	19	21	15	13	6	6.5	7	7	80.8	43.0	43.0	49.0	7	14	69.0	77.0	7	14	48.0	50.0	7	8	7	7	74.4	185	197	209	7	6.5	60.0	69.0	5	12	6	8	0
20 FT	20	23	16	13	6	6	7	7	80.3	44.0	44.0	50.0	7	14	69.0	76.0	7	14	47.0	50.0	7	7	7	7.5	74.0	187	199	211	7	7	59.0	70.0	5	12	6	8	0
22 FT	22	24	17	13	6	6	7	7.5	80.1	46.0	46.0	52.0	7	14	68.0	76.0	7	14	47.0	50.0	7	7	7	7.5	73.3	188	200	212	7	6.5	59.0	70.0	5	12	6	7.5	0
24 FT	23	25	17	13	7	7.5	7	7	79.4	47.0	47.0	53.0	7	14	67.0	76.0	7	14	47.0	50.0	7	6	7	7	72.5	189	201	213	7	6	59.0	70.0	5	12	6	7.5	0
26 FT	25	27	18	13	7	7	7	7	79.6	49.0	49.0	55.0	7	14	67.0	76.0	7	14	47.0	50.0	7	6.5	7	7.5	72.5	191	203	215	7	6	59.0	70.0	5	12	6	7	0
28 FT	26	29	19	13	7	7	7	7	79.6	50.0	50.0	50.0	7	13	66.0	76.0	7	13	46.0	50.0	7	6	6	6	69.5	193	205	217	8	7.5	65.0	76.0	5	12	6	6.5	0
30 FT	27	30	19	13	7	6.5	7	6.5	79.3	51.0	51.0	57.0	7	13	66.0	76.0	7	13	46.0	49.0	8	7.5	7	7.5	72.1	194	206	218	8	7.5	65.0	77.0	5	12	6	6.5	0
32 FT	29	31	20	13	7	6	7	7	79.5	53.0	53.0	59.0	7	12	65.0	75.0	7	12	44.0	47.0	8	7	7	8	71.9	195	207	219	8	7	65.0	77.0	5	12	6	6.5	0
34 FT	30	33	21	13	7	6	7	7	79.9	54.0	54.0	54.0	7	12	65.0	75.0	7	12	44.0	47.0	8	7	6	6	69.0	197	209	221	8	6.5	65.0	77.0	5	12	6	6	0
36 FT	31	34	22	13	8	7.5	7	6.5	80.1	55.0	61.0	61.0	8	15	73.0	82.0	8	15	52.0	55.0	8	7	7	7.5	71.9	198	210	222	8	6.5	65.0	77.0	5	12	6	6	0
38 FT	32	35	22	13	8	7	7	6	79.8	56.0	62.0	62.0	8	14	73.0	82.0	8	14	52.0	54.0	8	6.5	7	7.5	71.6	199	211	223	8	6.5	65.0	77.0	5	12	6	6	0
40 FT	33	36	23	13	8	6.5	7	6.5	80.4	57.0	63.0	63.0	8	13	73.0	82.0	8	13	51.0	54.0	8	6	7	7.5	71.8	200	212	224	8	6	65.0	77.0	5	12	7	7.5	0
42 FT	34	38	24	13	8	6.5	7	6.5	81.1	58.0	64.0	64.0	8	13	72.0	81.0	8	13	51.0	53.0	8	6.5	7	7	72.4	202	214	226	8	6	65.0	78.0	5	12	7	7.5	0
44 FT	35	39	25	13	8	6.5	7	6.5	81.9	59.0	65.0	65.0	8	13	72.0	81.0	8	13	50.0	52.0	8	6.5	7	7	72.5	203	215	227	8	6	65.0	78.0	5	12	7	7.5	0
46 FT	36	40	26	13	8	6.5	7	6.5	82.5	60.0	66.0	66.0	8	13	72.0	80.0	8	13	50.0	52.0	8	6.5	7	7	72.9	204	216	228	9	7.5	71.0	84.0	5	12	7	8	0
48 FT	37	41	27	13	8	6.5	7	6	83.3	67.0	67.0	67.0	8	12	72.0	79.0	8	12	49.0	51.0	8	6.5	7	7	73.1	205	217	229	9	7	71.0	84.0	5	12	7	8	0
50 FT	38	42	27	13	8	6	7	6.5	81.8	68.0	68.0	68.0	8	12	71.0	79.0	8	12	49.0	50.0	8	6	7	7	71.4	206	218	230	9	7	71.0	84.0	5	12	6	6	0



SPECIAL DESIGNS ARE REQUIRED WHEN THE DESIGN FILL IS LESS THAN 1 FOOT OR GREATER THAN 50 FEET.

DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.

DESIGN FILLS ARE MEASURED FROM THE TOP OF TOP SLAB TO THE TOP OF EARTH FILL OR ROADWAY.

CULVERTS MEET STRENGTH AND SERVICEABILITY REQUIREMENTS FOR THE DESIGN VEHICULAR LIVE LOAD HL-93 MINUS THE LANE LOAD.



MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)



CONCRETE TRIPLE BOX CULVERT

MEMBER THICKNESS BAR SIZE, SPACING & DIMENSIONS

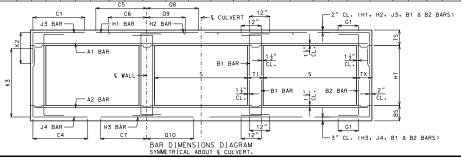
SPAN (S): 15 FEET HEIGHT (HT): 14 THRU 16 FEET

DATE EFFECTIVE: DATE PREPARED: 9/29/2011

703.87

SHEET NO. 25 OF 27

											S	SPAN ((8)	= 16	FT			HEIG	HT (H	T) =	11	FT O	R 12	2 FT	OR 1	3 FT											
		MEME										TOP SL	AB B	ARS												BOTTOM	SLAB I	BARS							L BA		
DESIGN		THICK	NE S	S	A1	BARS			J3	BARS				H1	BARS			H2	BARS		A2	BARS			J4	BARS				Н3	BARS		B1	BARS	B2	2 BAR	ŝ
FILL	TS	BS	ТX	ΤI	SIZE	SPA.	SIZE	SPA.	C1	HT=11	K2 HT=12	HT=13	SIZE	SPA.	C5	08	SIZE	SPA.	C6	09	SIZE	SPA.	SIZE	SPA.	C4	HT=11'	K3 HT=12	HT=13′	SIZE	SPA.	C7	010	SIZE	SPA.	SIZE	SPA.	G1
1 FT	15	11	9	10	6	7.5	5	6	77.5	35.0	35.0	35.0	6	16	155.5	118.5	6	16	52.0	57.0	5	6.5	6	6	87.6	139	151	163	6	6	65.0	69.0	5	12	5	8.5	12
2 FT	16	12	9	10	6	7	5	6	77.5	36.0	36.0	36.0	6	14	155.5	118.5	6	14	49.0	54.0	5	6	6	6	79.0	140	152	164	6	6	64.0	69.0	5	12	5	8.5	12
4 FT	13	12	10	10	6	6.5	6	7	76.3	37.0	37.0	37.0	6	12	91.0	115.0	6	12	42.0	45.0	5	6	6	6	69.6	140	152	164	7	6.5	65.0	72.0	5	10.5	5	8	12
6 FT	13	13	10	10	6	6.5	6	7	67.3	37.0	37.0	37.0	7	15	77.0	88.0	7	15	43.0	45.0	6	7.5	6	6.5	64.3	141	153	165	7	6	64.0	72.0	5	12	5	8	12
8 FT	14	14	10	10	6	7	6	6.5	61.5	38.0	38.0	38.0	7	15	71.0	79.0	7	15	41.0	44.0	6	7	6	6	60.3	142	154	166	7	6	62.0	72.0	5	12	5	8	0
10 FT	15	16	10	10	6	6.5	6	6	63.9	35.0	39.0	39.0	7	14	76.0	85.0	7	14	49.0	51.0	6	6.5	6	6	57.6	144	156	168	7	6.5	61.0	72.0	5	12	5	8	0
12 FT	16	18	11	10	6	6.5	6	6	62.9	36.0	40.0	40.0	7	14	74.0	83.0	7	14	48.0	51.0	6	6.5	6	7	56.4	146	158	170	7	6.5	61.0	73.0	5	12	5	7.5	0
14 FT	18	19	12	10	6	6.5	6	6.5	61.8	38.0	42.0	42.0	7	14	72.0	82.0	7	14	48.0	51.0	6	6	6	7	55.8	147	159	171	7	6.5	61.0	73.0	5	12	5	7	0
16 FT	19	21	12	10	6	6	6	6	60.8	39.0	43.0	43.0	7	13	71.0	81.0	7	13	47.0	51.0	7	8	6	7	54.6	149	161	173	7	6.5	60.0	73.0	5	12	5	7	0
18 FT	20	22	12	10	7	8	7	8	64.6	40.0		44.0	7	13	70.0	81.0	7	13	47.0	51.0	7	7.5	6	6	53.8	150	162	174	7	6.5	60.0	73.0	5	12	5	7	0
20 FT		24	13	10	7	8	6	6	59.6	42.0	46.0	46.0	7	13	69.0	81.0	7	13	47.0	51.0	7	7	6	7	53.6	152	164	176	7	6.5	60.0	73.0	5	12	5	6.5	0
22 FT	23	25	14	10	7	7	6	6	59.8	43.0		47.0	7	12	69.0	80.0	7	12	47.0	50.0	7	6.5	6	7	53.5	153	165	177	7	6.5	60.0	73.0	5	12	5	6.5	0
24 FT		27	14	10	7	7	6	6	59.1	45.0	49.0	49.0	7	13	68.0	80.0	7	13	46.0	50.0	7	6.5	6	7	53.3	155	167	179	7	6	60.0	74.0	5	12	5	6	0
26 FT		29	14	10	7	6.5	6	6	58.6	51.0		51.0	7	13	67.0	80.0	7	13	46.0	50.0	7	6	6	7	53.0	157	169	181	8	7.5	66.0	80.0	5	12	5	6	0
28 FT		30	15	10	7	6.5	6	6	59.1	52.0	52.0	52.0	7	12	67.0	79.0	7	12	46.0	50.0	8	7.5	6	7	53.1	158	170	182	8	7.5	66.0	80.0	5	12	6	8	0
30 FT		32	15	10	7	6	6	6	58.8	54.0		54.0	7	12	67.0	79.0	7	12	45.0	48.0	8	7	6	7	53.0	160	172	184	8	7	66.0	80.0	5	12	6	8	0
32 FT		33	15	10	8	7.5	7	7	63.4	55.0		55.0	8	15	74.0	87.0	8	15	53.0	56.0	8	7	6	7	52.8	161	173	185	8	6.5	66.0	80.0		12	6	8	0
34 FT	32	34	16	10	8	7	7	7.5	63.9	56.0	56.0	56.0	8	14	74.0	86.0	8	14	52.0	56.0	8	6	6	7	52.9	162	174	186	8	6	66.0	80.0	5	12	6	8	0
36 FT		36	16	10	8	7	7	7.5	63.8	58.0	58.0	58.0	8	14	74.0	85.0	8	14	51.0	54.0	8	6.5	6	6.5	52.9	164	176	188	8	6	66.0	80.0	5	12	6	8	0
38 FT		37	17	10	8	6.5	7	7.5	64.4	59.0		59.0	8	13	74.0	85.0	8	13	51.0	53.0	8	6	6	6.5	53.1	165	177	189	8	6	66.0	80.0	5	12	6	7.5	0
40 FT		39	17	10	8	6.5	7	7	64.4	60.0		60.0	8	13	73.0	84.0	8	13	50.0	53.0	8	6.5	6	6	53.1	167	179	191	8	6	66.0	80.0	5	12	6	7.5	0
42 FT	37	40	17	10	8	6	7	6.5	64.3	61.0		61.0	8	12	73.0	84.0	8	12	50.0	52.0	8	6	6	6	53.1	168	180	192	9	7	72.0	86.0	5	12	6	7.5	0
44 FT	38	41	18	10	8	6	7	7	65.0	62.0	62.0	68.0	8	12	73.0	83.0	8	12	49.0	51.0	8	6	7	8	56.6	169	181	193	9	7	72.0	86.0	5	12	6	7	0
46 FT		43	19	10	8	6	7	7.5	66.0	63.0		69.0	8	12	73.0	82.0	8	12	49.0		8	6	7	7.5	57.1	171	183	195	9	7	72.0	87.0	5	12	6	6.5	0
48 FT	40		19	10	8	6	7	6.5	66.0	70.0		70.0	8	12	72.0	81.0	8	12	48.0	50.0	8	6	7	7	57.3	172	184	196	9	7	72.0	87.0	5	12	6	6.5	0
50 FT	41	45	20	10	9	7.5	7	7	66.9	71.0	71.0	71.0	9	15	80.0	88.0	9	15	56.0	57.0	8	6	7	7	57.6	173	185	197	9	6.5	72.0	87.0	5	12	6	6.5	0



IF DESIGN FILL IS BETWEEN TABULATED DESIGN FILLS. USE THE VERY GERATEN ABULETT DESIGN FILL LICEDET FOR DESIGN FILES AND A FER USE NEW 2 THE OFFICE THE STATE OF T

SPECIAL DESIGNS ARE REQUIRED WHEN THE DESIGN FILL IS LESS THAN 1 FOOT OR GREATER THAN 50 FEET.

DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.

DESIGN FILLS ARE MEASURED FROM THE TOP OF TOP SLAB TO THE TOP OF EARTH FILL OR ROADWAY.

CULVERTS MEET STRENGTH AND SERVICEABILITY REQUIREMENTS FOR THE DESIGN VEHICULAR LIVE LOAD HL-93 MINUS THE LANE LOAD.



MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)

CONCRETE



TRIPLE BOX CULVERT

MEMBER THICKNESS
BAR SIZE, SPACING & DIMENSIONS

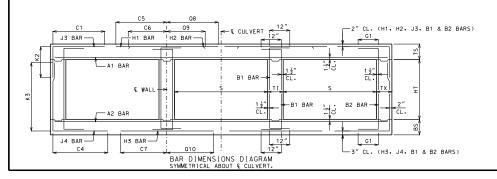
SPAN (S): 16 FEET HEIGHT (HT): 8 THRU 13 FEET

DATE EFFECTIVE: DATE PREPARED: 9/29/2011

703.87

SHEET NO. 26 OF 27

														= 16	FT			HE I G	нт (н	T) =	14	FT O	R 15	5 FT		6 FT											\Box
		MEM	BER									TOP SL	AB B	ARS											Е	MOTTO	SLAB I	BARS						₩AL	L BA	·RS	
DESIGN		THIC	NESS	3	A1 8	BARS			J:	BARS				H1	BARS			H2	BARS		A2	BARS			J4	BARS				Н3	BARS		B1	BARS	B2	2 BAR	5
FILL	TS	BS	ТX	ΤI	SIZE	SPA.	SIZE	SPA.	C1	HT=14	K2 HT=15	HT=16'	SIZE	SPA.	C5	08	SIZE	SPA.	C6	09	SIZE	SPA.	SIZE	SPA.	C4	HT=141	K3 HT=15′	HT=161	SIZE	SPA.	C7	010	SIZE	SPA.	SIZE	SPA.	G1
1 FT	15	11	12	13	6	7.5	6	8	82.9	35.0	35.0	39.0	6	16	160.5	120.5	6	16	51.0	55.0	5	6.5	6	6	97.5	175	187	199	7	7	70.0	71.0	5	10.5	5	7	12
2 FT	16	12	12	13	6	7.5	6	8	82.9	36.0	36.0	40.0	6	15	160.5	120.5	6	15	49.0	52.0	5	6	6	6	93.3	176	188	200	7	7	69.0	71.0	5	12	5	7	12
4 FT	12	13	13	13	6	6.5	6	6.5	94.8	36.0	36.0	36.0	7	16	92.0	94.0	7	16	46.0	46.0	5	6	6	6.5	87.8	177	189	201	7	7	68.0	73.0	5	8.5	5	6.5	12
6 FT	13	13	13	13	6	7	6	7	82.5	37.0	37.0	37.0	7	16	77.0	81.0	7	16	44.0	45.0	6	7.5	6	6	79.3	177	189	201	7	6	66.0	71.0	5	12	5	6.5	12
8 FT	14	15	13	13	6	7	6	6.5	77.9	38.0	38.0	38.0	7	15	73.0	77.0	7	15	43.0	44.0	6	7.5	6	6.5	77.8	179	191	203	7	6.5	64.0	72.0	5	12	5	6.5	0
10 FT	15	16	13	13	6	7	6	6	80.9	39.0	39.0	39.0	7	15	78.0	83.0	7	15	50.0	51.0	6	6.5	6	6	75.3	180	192	204	7	6	63.0	72.0	5	12	5	6.5	0
12 FT	16	18	14	13	6	6.5	6	6	78.5	40.0	40.0	40.0	7	14	76.0	82.0	7	14	49.0	51.0	6	6.5	6	6	73.8	182	194	206	7	6.5	63.0	72.0	5	12	5	6	0
14 FT	17	19	14	13	6	6	7	7.5	81.6	41.0	41.0	47.0	7	13	74.0	81.0	7	13	49.0	51.0	6	6	7	7.5	75.0	183	195	207	7	6.5	62.0	72.0	5	12	5	6	0
16 FT	19	21	15	13	6	6.5	7	7.5	80.9	43.0	43.0	49.0	7	14	73.0	81.0	7	14	49.0	51.0	7	8	7	7.5	74.0	185	197	209	7	6.5	62.0	73.0	5	12	6	8	0
18 FT	20	22	16	13	6	6	7	7.5	80.0	44.0	44.0	50.0	7	13	72.0	80.0	7	13	49.0	51.0	7	7.5	7	7.5	72.9	186	198	210	7	6.5	62.0	73.0	5	12	6	8	0
20 FT	22	24	16	13	6	6	7	7	79.1	46.0	46.0	52.0	7	13	71.0	80.0	7	13	48.0	51.0	7	7	7	7.5	72.3	188	200	212	7	6.5	62.0	73.0	5	12	6	8	0
22 FT	23	25	17	13	7	7.5	7	7	78.8	47.0	47.0	53.0	7	13	70.0	80.0	7	13	48.0	51.0	7	6	7	8	71.5	189	201	213	7	6	62.0	73.0	5	12	6	7.5	0
24 FT	25	27	17	13	7	7	7	7	78.1	49.0	49.0	55.0	7	13	70.0	80.0	7	13	48.0	51.0	7	6.5	7	7	71.3	191	203	215	7	6	61.0	73.0	5	12	6	7.5	0
26 FT	26	29	18	13	7	7	7	7	78.1	50.0	50.0	56.0	7	12	69.0	79.0	7	12	48.0	51.0	7	6	7	8	71.0	193	205	217	8	7.5	67.0	80.0	5	12	6	7	0
28 FT	28	30	19	13	7	6.5	7	7	78.3	52.0	52.0	52.0	7	12	68.0	79.0	7	12	47.0	51.0	8	7.5	6	6	67.8	194	206	218	8	7.5	67.0	80.0	5	12	6	6.5	0
30 FT	29	32	19	13	7	6	7	6.5	77.9	53.0	53.0	59.0	7	12	68.0	79.0	7	12	47.0	51.0	8	7	7	7.5	70.5	196	208	220	8	7	67.0	80.0	5	12	6	6.5	0
32 FT		33	20	13	8	7.5	7	6.5	78.1	55.0	55.0	61.0	8	15	76.0	87.0	8	15	53.0	57.0	8	7	7	8	70.4	197	209	221	8	6.5	67.0	80.0	5	12	6	6.5	0
34 FT	32	34	20	13	8	7.5	7	6	77.6	56.0	56.0	62.0	8	14	75.0	86.0	8	14	53.0	56.0	8	6	7	7	70.0	198	210	222	8	6	67.0	80.0	5	12	6	6.5	0
36 FT	33	36	22	13	8	7	7	6.5	78.8	57.0	63.0	63.0	8	14	75.0	86.0	8	14	53.0	56.0	8	6.5	7	7.5	70.3	200	212	224	8	6	67.0	81.0	5	12	6	6	0
38 FT	34	37	23	13	8	6.5	7	6.5	79.1	58.0	64.0	64.0	8	13	75.0	85.0	8	13	53.0	56.0	8	6	7	7.5	70.3	201	213	225	8	6	67.0	81.0	5	12	6	6	0
40 FT	36	39	23	13	8	6.5	7	6.5	79.0	60.0	66.0	66.0	8	13	75.0	85.0	8	13	51.0	54.0	8	6.5	7	7.5	70.3	203	215	227	8	6	67.0	81.0	5	12	7	7.5	0
42 FT	37	40	23	13	8	6.5	7	6	78.9	61.0	67.0	67.0	8	12	74.0	84.0	8	12	51.0	53.0	8	6	7	7	70.3	204	216	228	9	7	73.0	87.0	5	12	7	7.5	0
44 FT	38	42	24	13	8	6	7	6	79.8	68.0	68.0	68.0	8	12	74.0	83.0	8	12	50.0	52.0	8	6	7	7	70.8	206	218	230	9	7	73.0	87.0	5	12	7	7.5	0
46 FT	39	43	26	13	8	6	7	6.5	81.4	69.0	69.0	69.0	8	12	74.0	83.0	8	12	50.0	52.0	8	6	7	7	71.3	207	219	231	9	7	73.0	87.0	5	12	7	7.5	0
48 FT	40	44	27	13	8	6	7	6	82.1	70.0	70.0	70.0	8	12	74.0	82.0	8	12	49.0	51.0	8	6	7	7	71.6	208	220	232	9	7	73.0	88.0	5	12	7	8	0
50 FT	41	45	28	13	9	7.5	7	6	83.0	71.0	71.0	71.0	9	15	82.0	89.0	9	15	57.0	58.0	8	6	7	7	72.0	209	221	233	9	6.5	73.0	88.0	5	12	7	8	0



SPECIAL DESIGNS ARE REQUIRED WHEN THE DESIGN FILL IS LESS THAN 1 FOOT OR GREATER THAN 50 FEET.

DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.

DESIGN FILLS ARE MEASURED FROM THE TOP OF TOP SLAB TO THE TOP OF EARTH FILL OR ROADWAY.

CULVERTS MEET STRENGTH AND SERVICEABILITY REQUIREMENTS FOR THE DESIGN VEHICULAR LIVE LOAD HL-93 MINUS THE LANE LOAD.



MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)



CONCRETE TRIPLE BOX CULVERT

MEMBER THICKNESS BAR SIZE, SPACING & DIMENSIONS

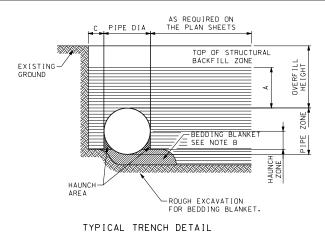
SPAN (S): 16 FEET HEIGHT (HT): 14 THRU 16 FEET

THIS SHEET HAS BEEN SIGNED, SEALED AND DATED DATE EFFECTIVE: DATE PREPARED:

9/29/2011

703.87

SHEET NO. 27 OF 27



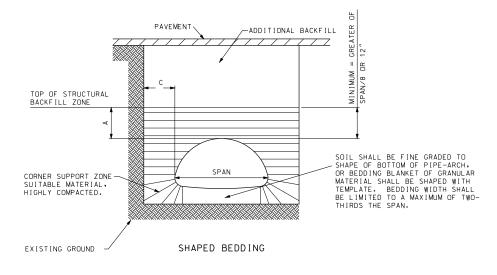
PIPE INSTALLATION AND BEDDING

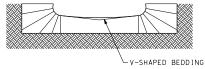
NOTE:

- A) MINIMUM STRUCTURAL BACKFILL OVER TOP OF PIPE SHALL BE ONE-EIGHTH DIAMETER OR SPAN OF PIPE OR ONE FOOT WHICHEVER IS GREATER.
- B) BEDDING BLANKET OF LOOSE FILL SHALL BE ROUGHLY SHAPED TO FIT BOTTOM OF PIPE. MINIMUM THICKNESS BEFORE PLACING PIPE SHALL BE AS FOLLOWS:

DEPTH OF CORRUGATION	MIN. BEDDING THICKNESS
1/2"	1 "
1 "	2"
2"	3″

C) TRENCH INSTALLATIONS - 2 FEET MINIMUM EACH SIDE OF CULVERT. THIS RECOMMENDED LIMIT SHOULD BE MODIFIED AS NECESSARY TO ACCOUNT FOR VARIABLES SUCH AS POOR IN-SITU SOILS. EMBANKMENT INSTALLATIONS - ONE DIAMETER OR SPAN EACH SIDE OF CULVERT.





ALTERNATIVE-SHAPED BEDDING

PIPE-ARCH TRENCH DETAIL

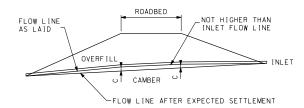
BEDDING AND CORNER ZONE TREATMENT FOR PIPE ARCH STRUCTURES



PI	PE
DIAMETER	SPACE S
UP TO 24"	12"
24" TO 72"	½ PIPE DIA
72" AND OVER	36"

PIPE-	-ARCHES
SPAN	SPACE X
UP TO 36"	12"
36" TO 108"	1/3 ARCH SPAN
108" TO 189"	36"

MULTIPLE STRUCTURE SPACING



TYPICAL CAMBERED FLOW LINE

NOTE:

ON YIELDING SOIL. PIPE CULVERTS SHALL BE PLACED ON A CAMBERED FLOW LINE. THE AMOUNT OF CAMBER WILL VARY WITH SOIL CONDITIONS AND WILL BE SPECIFIED ON THE DESIGN PLANS.



MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)



CORRUGATED METAL PIPE INSTALLATION METHODS

DATE EFFECTIVE: 04/01/2011 DATE PREPARED:

725.00C

SHEET NO. 1 OF 5

		C	ORRU	JGATE	ED MI	ETAL	IC-C	OATE	D ST	EEL	CIR	CUL AF	RPI	PE L	OCK	SEAM						
						MAX	IMUM	ALLOW	/ABLE	OVER	ILL I	HE I GH	TS (1)								
SPECIFIED	MINIMU	М								PECIFIE	D THIC	KNEWW (OF COAT	ED SHE	ET (IN.)						
DIAMETER OF PIPE	COVER	SPIRAL		0.	064			0.0	079			0.	109			0.	138			0.	168	
	CORRUGATED	.,,,,,		В	С	D	Α	В	С	D	Α	В	С	D	Α	В	С	D	Α	В	С	D
IN.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.
12	1	1	219	251	224	144	273	314	280	201	382	440	392	334	492	566	504	484	602	693	617	
15	1	1	175	201	179	115	218	251	224	161	306	352	314	267	394	453	403	387	481	555	493	
18	1	1	146	167	149	96	182	209	187	134	255	293	261	223	328	378	336	323	401	462	411	
21	1	1	125	143	128	82	156	179	160	115	219	251	224	191	281	324	288	277	344	396	352	
24	1	1	109	126	112	72	137	157	140	100	191	220	196	167	246	283	252	242	301	347	308	
30	1 1	1	87	100	90	57	109	126	112	80	153	176	157	134	197	227	202	194	241	277	247	
36	' '	1	73	84	75	48	91	105	93	67	127	147	131	111	164	189	168	161	201	231	206	
42	1	1	62	72	64	41	78	90	80	57	109	126	112	95	141	162	144	138	172	198	176	
48	1	1	55	63 56	56	36	68	78	70	50 45	96 85	110	98 87	83 74	123	142	126	121	150 134	173 154	154 137	
54 60	1	2		50	50 45	32 *	61	70 63	62 56	45	76	98 88	78	67	109 98	126 113	112	108 97	120	139	123	
66	1	2		46	45			57	51	37 *	16	80	71	61	89	103	92	88	109	126	112	
72	1	2		42	37			52	47	31 x		73	65	56	82	94	84	81	100	116	103	
78	1	2		39	34			48	43			68	60	51	02	87	78	75	89	107	95	
84	1	2		36	32			45	40			63	56	48*		81	72	69	77	99	88	
90	1	2		33	30			42	37			59	52	70%		76	67	65	- ' '	92	82	
96	1	2			- 50			39	35			55	49			71	63	60 *		87	77	
102	2	3						37	33			52	46			67	59	53 *		82	73	
108	2	3										49	44			63	56			77	69	
114	2	3										46	41			60	53			73	65	
120	2	3										44	39			57	50			69	62	
126	2	3														54	48			66	59	

CORRUGATED METALIC-COATED STEEL CIRCULAR PIPE RIVETED SEAM

											••••											
						MAX	IMUM	ALLOV	VABLE	OVER	FILL	HE I GH	TS (1)								
	MININ	JUM							S	PECIFI	ED THIC	KNEWW	OF COAT	ED SHE	ET (IN.)						
SPECIFIED DIAMETER	COVE	ER			064				079				109			0.					168	
OF PIPE	CORRUGATED		SINGLE		DOUBLE						-				SINGLE				SINGLE		DOUBLE	
7.51	FT.	RIB FT.	FT.	B FT.	FT.	B FT.	FT.	B FT.	FT.	B FT.	FT.	B FT.	FT.	B FT.	FT.	B FT.	FT.	B FT.	FT.	B FT.	FT.	B FT.
1N• 12	FI.	FI.	143	FI.	185	245	156	FI.	255	305	200	FI.	382	440	209	FI.	419	544	219	FI.	438	604
	1	-																				
15	1		114		148	196	124		204	244	160		306	352	168		335	436	175		351	483
18	1	1	95		123	164	104		170	203	133		255	293	140		279	363	146		292	403
21	1	1	82		105	140	89		146	174	114		219	251	120		239	311	125		251	345
24	1	1	71		92	123	78		127	153	100		191	220	105		209	272	109		219	302
30	1	1	57		74	98	62		102	122	80		153	176	84		168	218	88		175	242
36	1	1	48		62	82	52		85	102	67		127	147	70		140	181	73		146	201
42	1	1	41		53	70	44		73	87	57		109	126	60		120	156	63		125	173
48	1	1	36		46	61	39		64	76	50		96	110	52		105	136	55		110	151
54	1	2				55	35		57	68	44		85	98	47		93	121	49		97	134
60	1	2				49				61	40		76	88	42		84	109	44		88	121
66	1	2				45				55				80	38		76	99	40		80	110
72	1	2				41				51				73	35		70	91	36		73	101
78	1	2				38				47				68				84	34		67	93
84	1	2				35				44				63				78	31		63	86
90	1	2				33				41				59				73				81
96	1	2								38				55				68				76
102	2	3								36				52				64				71
108	2	3												49				60				67
114	2	3												46				57				64
120	2	3												44				54				60
126	2	3																52				58

* FOR TRENCH INSTALLATION ONLY

A = 2-2/3" X 1/2" CORRUGATIONS. B = 3" X 1" CORRUGATIONS. C = 5" X 1" CORRUGATIONS D = 3/4" X 3/4" X 7-1/2" SPIRAL RIB

(1) MAXIMUM OVERFILL MEASURED FROM THE TOP OF PIPE TO SURFACE.





CORRUGATED METAL PIPE INSTALLATION METHODS

DATE EFFECTIVE: 04/01/2011 DATE PREPARED: 3/9/2011

725.00C

SHEET NO. 2 OF 5

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)

			(ORRU	JGATI	ED H	32 A	LUMI	NUM	CIRC	CULAF	PIF	PE L	ОСК	SEAM							
						MAX	IMUM	ALLOW	ABLE	OVER	FILL	HE I GH	TS (1)								
SPECIFIED	MINIMU									PECIFI	ED THIC	KNEWW (OF COAT	ED SHE	ET (IN.)						
DIAMETER	COVER	CDIDAL		0.	06			0.0	075			0.	105			0.	135			0.	164	
OF PIPE	CORRUGATED	RIB	Α	В	С	D	Α	В	С	D	Α	В	С	D	Α	В	С	D	Α	В	С	D
IN.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.
12	1	1	132	152		71	165	191		97	232	267		156	298	357		221	364	420		
15	1	1	106	122		57	132	153		78	185	213		125	239	286		176	291	336		
18	1	1	88	101		47	110	127		65	155	178		104	199	238		147	243	280		
21	1	1	76	87		41	95	109		56	132	152		89	170	204		126	208	240		
24	1	1	66	76		35	83	96		49	116	133		78	149	178		110	182	210		
30	1	2		61		28	66	76		39	93	107		62	119	143		88	146	168		
36	1	2		51		24*	55	64		32	77	89		52	99	119		74	121	140		
42	1	2		43				55		28 *	66	76		45	85	102		63	104	120		
48	1	2		38				48			58	67		39	75	89		55	91	105		
54	1	2		34				42			51	59		35	66	79		49	81	93		
60	1	2		30				38				53		31 *	55	71		44	68	84		
66	1	2		28				35				48				65		40	56	76		
72	1	3		25				32				44				59		37 *	46	70		——
78	1	3						29				41				55				65		\vdash
84	1	3										38				51				60		— —
90	1	3										36				48				56		$\vdash \vdash \vdash$
96	1	3										33				45				53		
102	2	4														42				49		—
108	2	4														39				47		
114	2	4																		42		\vdash
120	2	4																		39		\vdash
126	2	4																				

CORRUGATED H32 ALUMINUM CIRCULAR PIPE RIVETED SEAM

						MAX	IMUM	ALLOW			FILL H											
	MINIM	MUM							S	PECIFIE	ED THIC			ED SHE	ET (IN.)						
SPECIFIED DIAMETER	COVE	R			.06				075				105				135				164	
OF PIPE	CORRUGATED		SINGLE		DOUBLE						SINGLE								SINGLE			
		RID	A	В	A	В	A	В	Α	В	A	В	Α	В	_ A	В	Α	В	_ A	В	Α	В
IN.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.
12	'	1	77	 	120	141	77		154	175	133	<u> </u>	269	239	138		282	359	144	-	291	466
15	1	1	62	 	96	113	62		123	140	107		215	191	111		226	287	115		232	373
18	1	1	51	ــــــ	80	94	51	ــــــ	103	117	89		179	160	92		188	239	96		194	311
21	1	1	44		68	81	44		88	100	76		154	137	79		161	205	82		166	266
24	1	1	38		60	71	38		77	88	67		135	120	69		141	179	72		145	233
30	1	2				56	31		62	70	53		108	96	55		113	144	57		116	186
36	1	2				47	26		51	58	44		90	80	46		94	120	48		97	155
42	1	2				40				50	38		77	68	40		81	103	41		83	133
48	1	2				35				44	33		67	60	35		71	90	36		73	116
54	1	2				31				39	30		56	53	31		63	80	32		65	104
60	1	2				28				35				48	28		56	72	29		58	93
66	1	2				26				32				44				65	26		53	85
72	1	3		1	1	24		1	1	29				40			1	60	24		47	78
78	1	3		1	1	1				27				37				55				72
84	1	3					†							34				51				67
90	1	3		 	 	 	+	 	 	 				32	—			48	$\overline{}$			62
96	1	3												30				45	-			58
102	2	4		+	+	+												42	_		_	55
108	2	4																40	_			51
114	2	4					+						_		—			- 10	_			46
120	2	4	 	+	+	+	+						_		—			 	+			41
126	2	4	-	+	+	+	+						-	-	-						-	
120		4 1									1 1											1

* FOR TRENCH INSTALLATION ONLY

A = 2-2/3" X 1/2" CORRUGATIONS. B = 3" X 1" CORRUGATIONS. C = 5" X 1" CORRUGATIONS D = 3/4" X 3/4" X 7-1/2" SPIRAL RIB

(1) MAXIMUM OVERFILL MEASURED FROM THE TOP OF PIPE TO SURFACE.



MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)



CORRUGATED METAL PIPE INSTALLATION METHODS

DATE EFFECTIVE: 04/01/2011 DATE PREPARED: 3/9/2011

725.00C

SHEET NO. 3 OF 5

			(ORRU	JGATI	ED H	34 A	LUMI	NUM	CIRC	CULAF	R PII	PE LI	OCK	SEAM							
	MAXIMUM ALLOWABLE OVERFILL HEIGHTS (1)																					
SPECIFIED																						
DIAMETER	COVER	CDIDAL		0.	06			0.0	075			0.	105			0.	1 3 5			0.	164	
OF PIPE	CORRUGATED	RIB	Α	В	С	D	Α	В	С	D	Α	В	С	D	Α	В	С	D	Α	В	С	D
IN.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.
12	1	1	159	183		85	199	229		117	278	320		187	358	428		265	437	504		
15	1	1	127	146		68	159	183		93	223	256		150	286	343		212	350	403		
18	1	1	106	122		57	132	153		78	185	213		125	239	286		176	291	336		
21	1	1	91	104		49	113	131		67	159	183		107	205	245		151	250	288		
24	1	1	79	91		43	99	115		58	139	160		94	179	214		132	218	252		
30	1	2		73		34	79	92		47	111	128		75	143	171		106	175	202		
36	1	2		61		28*	66	76		39	93	107		62	119	143		88	146	168		
42	1	2		52				66		33 *	79	91		54	102	122		76	125	144		
48	1	2		46				57			68	80		47	89	107		66	109	126		
54	1	2		41				51			56	71		42	73	95		59	90	112		
60	1	2		37				46				64		37 *	59	86		53	73	101		
66	1	2		33				42				58				78		48	59	92		
72	1	3		30				38				53				71		42 *	47	84		
78	1	3						35				49				66				78		
84	1	3										46				61				72		
90	1	3										43				57				67		
96	1	3										39				53				62		
102	2	4														48				56		
108	2	4														43				51		
114	2	4																		46		
120	2	4																		41		
126	2	4																				

CORRUGATED H34 ALUMINUM CIRCULAR PIPE RIVETED SEAM

						MAX	IMUM	ALLOW														
	MININ	/UM		SPECIFIED THICKNESS OF COATED SHEET (IN.)																		
SPECIFIED DIAMETER	I CUVE				06			0.0					105			0.					164	
OF PIPE	CORRUGATED		SINGLE		DOUBLE																DOUBLE	
IN.	FT.	RIB FT.	FT.	B FT.	FT.	B FT.	FT.	B FT.	FT.	B FT.	FT.	B FT.	FT.	B FT.	FT.	B FT.	FT.	B FT.	FT.	B FT.	FT.	B FT.
12	1	1	77	FI.	120	141	77	FI.	154	175	133	FI.	269	239	138	FI.	282	359	144	FI.	291	466
15	1	1	62		96	113	62		123	140	107		215	191	111		226	287	115		232	373
	- '				-									-								
18	1	1	51		80	94	51		103	117	89		179	160	92		188	239	96		194	311
21	1	1	44		68	81	44		88	100	76		154	137	79		161	205	82		166	266
24	1	1	38		60	71	38		77	88	67		135	120	69		141	179	72		145	233
30	1	2				56	31		62	70	53		108	96	55		113	144	57		116	186
36	1	2				47	26		51	58	44		90	80	46		94	120	48		97	155
42	1	2				40				50	38		77	68	40		81	103	41		83	133
48	1	2				35				44	33		67	60	35		71	90	36		73	116
54	1	2				31				39	30		56	53	31		63	80	32		65	104
60	1	2				28				35				48	28		56	72	29		58	93
66	1	2				26				32				44				65	26		53	85
72	1	3				24				29				40				60	24		47	78
78	1	3								27				37				55				72
84	1	3												34				51				67
90	1	3												32				48				62
96	1	3												30				45				58
102	2	4																42				55
108	2	4																40				51
114	2	4																				46
120	2	4																				41
126	2	4																				

* FOR TRENCH INSTALLATION ONLY

A = 2-2/3" X 1/2" CORRUGATIONS. B = 3" X 1" CORRUGATIONS. C = 5" X 1" CORRUGATIONS D = 3/4" X 3/4" X 7-1/2" SPIRAL RIB

(1) MAXIMUM OVERFILL MEASURED FROM THE TOP OF PIPE TO SURFACE.



MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)



CORRUGATED METAL PIPE INSTALLATION METHODS

DATE EFFECTIVE: 04/01/2011 DATE PREPARED: 4/1/2013

725.00C

SHEET NO. 4 OF 5

MINIMU	MINIMUM COVER FOR CONSTRUCTION LOADS (ROUND AND PIPE-ARCH)													
DIAMETER	THE TOWNED WALL COMES (E)													
OR PIPE SPAN	18K LBS 50K LBS 75K LBS 110K LBS 50K LBS. 75K LBS. 110K LBS. 150K LBS.													
IN.	FT.	FT.	FT.	FT.										
12-42	2.0	2.5	3.0	3.0										
48-72	3.0	3.0	3.5	4.0										
78-120	3.0	3.5	4.0	4.0										
126-144	3.5	4.0	4.5	4.5										

THE CONTRACTOR SHALL PROVIDE MINIMUM COVER PLUS ANY ADDITIONAL COVER REQUIRED TO AVOID DAMAGE TO THE PIPE. IN UNPAVED SITUATIONS. THE SURFACE MUST BE MAINTAINED TO A LEVEL AND NON-RUTTED CONDITION.

	PIPE-ARCH REQUIREMENTS 2-2/3" X 1/2" CORRUGATIONS													
TYPE	(3) (3) GAUGE													
(IN.) (IN.) (IN.)														
B1														
B2														
B3	24	18	0.064 - 16											
B4	28	20	0.064 - 16											
B5	35	24	0.064 - 16											
В6	42	29	0.079 - 14											
B7	49	33	0.109 - 12											
B8	57	38	0.109 - 12											
B9	64	43	0.109 - 12											
B10	B10 71 47 0.138 - 10													
B11 77 52 0.168 - 8														
B12	83	52												

- (2) MINIMUM COVER MEASURED FROM TOP OF PIPE TO BOTTOM OF FLEXIBLE PAVEMENT OR TOP OF RIGID PAVEMENT.
- (3) A TOLERANCE OF PLUS OR MINUS ONE INCH OR 2 PERCENT OF EQUIVALENT CIRCULAR DIAMETER. WHICHEVER IS GREATER, WILL BE PERMISSIBLE IN SPAN AND RISE.
- (4) TOLERANCES IN PARENTHESES. NO TOLERANCE IN OPPOSITE DIRECTION.

	PIPE-ARCH REQUIREMENTS 3" X 1" AND 5" X 1" CORRUGATIONS													
TYPE	SPAN (4)	RISE (4)	GALVANIZED SHEET THICKNESS - GAUGE	GALVANIZED SHEET THICKNESS - GAUGE	MINIMUM COVER (2)									
	(IN.)	(IN.)	(IN.)	(IN.)	(IN.)									
B8A	53 (-2.4)	41 (+2.4)	0.079 - 14	0.109 - 12	12									
B9A	60 (-2.7)	46 (+2.7)	0.079 - 14	0.109 - 12	15									
B10A	66 (-3.0)	51 (+3.0)	0.079 - 14	0.109 - 12	15									
B11A	73 (-3.3)	55 (+3.3)	0.079 - 14	0.109 - 12	18									
B12A	81 (-3.6)	59 (+3.6)	0.079 - 14	0.109 - 12	18									
B13A	87 (-4.4)	63 (+4.4)	0.079 - 14	0.109 - 12	18									
B14A	95 (-4.8)	67 (+4.8)	0.079 - 14	0.109 - 12	18									
B15A	103 (-5.2)	71 (+5.2)	0.079 - 14	0.109 - 12	18									
B16A	112 (-5.6)	75 (+5.6)	0.109 - 12	0.109 - 12	21									
B17A	117 (-5.9)	79 (+5.9)	0.109 - 12	0.109 - 12	21									
B18A	128 (-6.4)	83 (+6.4)	0.109 - 12	0.109 - 12	24									
B19A	137 (-6.9)	87 (+6.9)	0.109 - 12	0.109 - 12	24									
B20A	142 (-7.1)	91 (+7.1)	0.138 - 10	0.138 - 10	24									



MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)

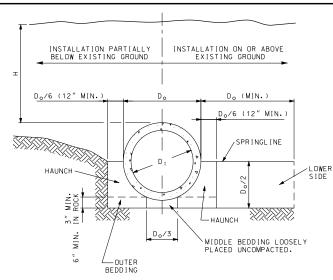


CORRUGATED METAL PIPE INSTALLATION METHODS

DATE EFFECTIVE: 04/01/2011 DATE PREPARED: 3/9/2011

725.00C

SHEET NO. 5 OF 5



EMBANKMENT INSTALLATIONS

CONSTRUCTION SEQUENCE

INSTALLATION

TYPE

TYPE 1

TYPE 2

TYPE 3

TYPE 4

- 1. PLACE BEDDING MATERIAL TO GRADE.
 DO NOT COMPACT.
 2. INSTALL PIPE TO GRADE.
- 3. COMPACT BEDDING OUTSIDE THE MIDDLE
- THIRD OF THE PIPE.

 4. PLACE AND COMPACT THE HAUNCH AREA
- UP TO THE SPRINGLINE. 5. COMPLETE BACKFILL ACCORDING TO SPECIFICATIONS.

4

I E T	PACT. PE TO GR DDING OU HE PIPE. COMPACT SPRINGLI ACKFILL	TSIDE THE THE HAUNC	MIDDLE H AREA		π .	INSTALLATI SUITABLE MA Do/6 (12" MIN.)	TERIAL	1	INSTALLATION IN UNSUITABLE MATERIAL VATION LINE AS REQUI	IRED	×
	MAX I	MUM DI	AME TER	R AND		HAUNCH		D	D _o /6 (12" MIN.) HAUNCH SPRINGLINE		
1	CLASS I	CLASS II MAXIMUM 108	ILL HE ASS OF PIE CLASS III DIAMETER (108 ILL HEIGHT	CLASS IV	72	m = vi		7/3	MIDDLE BEDDING LOOS	LOWER SIDE	
	12	15	21	33	51	BEDDI۱ مْ	(G		PLACED UNCOMPACTED.		
	9	12	17	26	39						

TRENCH INSTALLATION

- LEGEND -

D: = NORMAL INSIDE DIAMETER OF PIPE. Do = OUTSIDE DIAMETER OF PIPE.

H = FILL COVER HEIGHT OVER PIPE (FEET)

MIN. = MINIMUM

= UNDISTURBED SOIL

GENERAL NOTES:

MULTIPLE PIPE CULVERTS SHALL BE INSTALLED WITH A MINIMUM CLEARANCE BETWEEN PIPES OF $\frac{1}{2}$ D_ OR 12". WHICHEVER IS GREATER, BUT NOT TO EXCEED 36".

CLASS I AND CLASS II REINFORCED CONCRETE PIPE SHALL ONLY BE USED FOR SEWERS IN TRENCHES OUTSIDE ROADBED AND STREET LIMITS.



MODOT

RIGID CULVERT INSTALLATION METHODS

105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)

MISSOURI HIGHWAYS AND TRANSPORTATION

COMMISSION

REINFORCED CONCRETE PIPE CULVERTS

DATE EFFECTIVE: 04/01/2015 DATE PREPARED:

726.30J

SHEET NO. 1 OF 2

INSTALLATION PROCEDURE SHALL BE REQUIRED. IF FILL HEIGHT EXCEEDS 51 FEET AND PIPE DIAMETER IS GREATER THAN 36 INCHES A SPECIAL DESIGN PIPE

20

13

30

20

IS NOT ALLOWED.

FLOW LINE ROADBED
NOT HIGHER THAN INLET FLOW, LINE
OVERFILL IN ET
INLET
CAMBER
`FLOW LINE AFTER EXPECTED SETTLEMENT
NOTE: ON YIELDING SOIL. PIPE CULVERTS SHALL BE PLACED ON A CAMBERED FLOW LINE. THE AMOUNT OF CAMBER WILL VARY WITH SOIL CONDITION AND SHALL BE SPECIFIED ON THE DESIGN PLANS.

TYPICAL CAMBERED FLOW LINE

	AT I ON E					EQUIREME D PROCTO		
	ALLA TYPE	BEDDING	HAUNCH	AND OUTER	BEDDING	LOWE	R SIDE BED	DING
ET INSTAL		THICKNESS	CATEGORY 1	CATEGORY 2	CATEGORY 3	CATEGORY 1	2	CATEGORY 3
			SOIL (A)	SOIL (B)	SOIL (C)	SOIL (A)	SOIL (B)	SOIL (C)
	1	D _o /24 MINIMUM, NOT LESS THAN 3". IF ROCK FOUNDATION, USE D _o /12 MIMIMUM, NOT LESS THAN 6".	95	N/A	N/A	90	95	100
	2	D ₀ /24 MINIMUM, NOT LESS THAN 3". IF ROCK FOUNDATION, USE D ₀ /12 MIMIMUM, NOT LESS THAN 6".	90	95	N/A	85	90	95
	3	D _o /24 MINIMUM, NOT LESS THAN 3". IF ROCK FOUNDATION, USE D _o /12 MIMIMUM, NOT LESS THAN 6".	85	90	95	85	90	95
	4	D _o /24 MINIMUM, NOT LESS THAN 3". IF ROCK FOUNDATION, USE D _o /12 MIMIMUM, NOT LESS THAN 6".	NO COMPACTION REQUIRED	NO COMPACTION REQUIRED	85	NO COMPACTION REQUIRED	NO COMPACTION REQUIRED	85

9

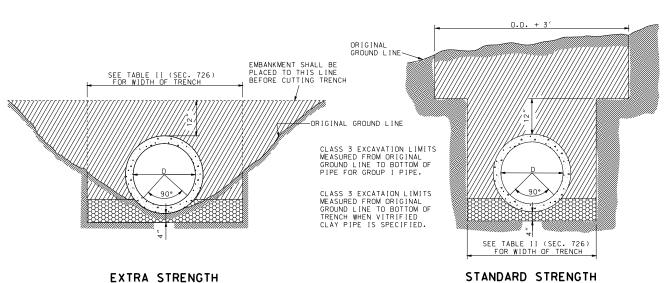
6

IF FILL HEIGHT EXCEEDS 51 FEET AND PIPE DIAMETER IS 36 INCHES OR LESS A SPECIAL PIPE DESIGN AND

13

BEDDING AND COMPACTION REQUIREMENTS

- (A) GRAVELLY SAND SANDY-SILT (B)
- (C) SILTY CLAY



S	TANDARD	STRENGTH	

	HEIGHT OF FILL OVER V.C. PIPE CULVERTS												
	STANDARD STRENGTH EXTRA STRENGTH												
NOMINAL PIPE DIAMETER (INCH)	IPE AT ONE FOOT FILL FILL AT ONE FOOT FILL FILL METER ABOVE TOP OF HEIGHT HEIGHT ABOVE TOP OF HEIGHT HEIGHT NCH) PIPE (FEET) (FEET) (FEET) (FEET) (FEET) (FEET)												
6	6 2.0 1.0 9.0												
8	2.0	1.0	7.0	2.5	4.0	12.0							
10	2.5	1.0	7.0	2.5	4.0	12.0							
12	2.7	1.0	6.0	3.0	4.0	13.0							
15	3.5	1.0	6.0	3.0	4.0	17.0							
18	3.5	1.0	6.0	3.5	4.0	17.0							
21	4.0	1.0	6.0	4.0	4.0	17.0							
24	4.0	1.0	8.0	4.0	3.0	19.0							
30	30 4.5 1.0 10.0 4.5 3.0 19.0												
36	5.0	1.0	11.0	5.0	3.0	19.0							

LEGEND

COMPACTED ROADWAY EMBANKMENT

[//////] SUITABLE BACKFILL

LOOSE DRY MATERIAL

COMPACTED SAND

MODOT

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)



RIGID CULVERT INSTALLATION METHODS VITRIFIED CLAY

PIPE CULVERTS

DATE EFFECTIVE: 04/01/2015 DATE PREPARED: 2/20/2015

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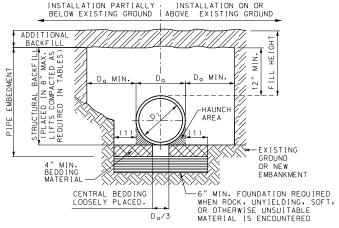
SHEET NO. 2 OF 2

TRENCH INSTALLATION

LEGEND

D: = INSIDE DIAMETER OF PIPE. Do = OUTSIDE DIAMETER OF PIPE.

(1) = (Do/4)+6" (MIN.) MULTIPLE PIPE SHALL BE INSTALLED WITH A MINIMUM CLEARANCE BETWEEN PIPES OF ½ DO OR 12", WHICHEVER IS GREATER, BUT NOT TO EXCEED 36".



EMBANKMENT INSTALLATION

CONSTRUCTION SEQUENCE

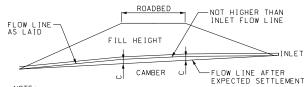
- 1. PLACE BEDDING MATERIAL TO GRADE.
- 2. COMPACT BEDDING OUTSIDE THE MIDDLE THIRD OF THE PIPE.
- 3. INSTALL PIPE TO GRADE.
- 4. COMPLETE STRUCTURAL BACKFILL ACCORDING TO SPECIFICATIONS.

							FILL H	EIG	HT	LIM	ITS								
	SPECIFIED	F	POLYET	THYLEN	1E	STEEL RE POLYET	INFORCED HYLENE		POLY	VINYL		Р	DOUBL OLYPR	E WALI	L NE	PI	TR I PL I OL YPRI	E WALI	NE
STRUCTURAL BACKFILL	NOMINAL DIA OF PIPE (IN.)		CTION SPD		ACTION SPD	COMP A 90%		COMPA 90%		COMP # 95%	CTION SPD	COMP # 90%		COMP # 95%		COMPA 90%		COMP / 95%	
		MIN.		MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.		MIN.	MAX.	MIN.	MAX.
	12	2'	19'	2'	26′			2'	32′	2'	61′	2'	21′	2'	29'				
3.00	15	2'	19'	2'	27′			2'	32′	2′	55′	2'	22'	2'	31′				
_ <	18	2'	17′	2'	25′			2'	31′	2'	60′	2'	19′	2'	27'				
112 € ∞	24	2'	15′	2'	21'	2′	50′	2'	30′	2'	54'	2'	16′	2'	22'				
GRAVEL ASHTO M145 TYPE A1 &	30	2'	17′	2'	24'	2′	50′	2'	31′	2′	52'	2'	11′	2'	15′	2′	17′	2'	23'
뚱요	36	2'	13′	2′	19′	2 ′	50′	2'	30′	2′	53′					2'	15′	2'	21'
E	42	2'	13′	2'	19'	2′	50′									2'	19'	2'	27'
¥¥	48	2′	12'	2'	18′	2′	30'									2′	12'	2'	17'
	60	2′	13′	2'	20'	2′	30′									2'	16′	2'	23'
AND 15 SOIL -b)	12	2'	17′	2'	23′			2'	32'	2'	55′	2'	18′	2'	24'				
000	15	2'	16′	2'	22'			2'	32′	2'	49'	2'	22'	2'	31′				
₹ o o	18	2'	15′	2'	21'			2'	31′	2'	53′	2'	16′	2'	21′				
0.4	24	2'	14'	2'	20'	2'	50′	2'	30′	2'	48'	2'	13′	2'	17′				
NE -A	30	2'	13′	2'	19'	2′	50′	2'	31′	2'	46′	2'	7′	2'	10'	2′	17′	2'	23'
OURSE HTO N	36	2′	12'	2'	17'	2′	50′	2'	30′	2′	46′					2′	15′	2′	21'
35.5	42	2'	13′	2'	18′	2′	50′									2'	19'	2'	27'
Š	48	2′	12'	2'	17′	2′	30′									2'	12'	2'	17′
_	60	2′	13′	2'	20′	2′	30′									2′	16′	2′	23′
:	12	3.3'	10'	2′	17′			2.7'	16′	2′	33′	2.8	11′	2'	19'				
R -1 S 4	15	3.4	10'	2'	16′			2.7'	16′	2'	33′	2.8'	11′	2'	23′				
1 0 % " \ \	18	3.6	10'	2'	15′			2.7'	15′	2'	32'	3′	11′	2'	16′				
NA 4 4 0	24	3.8'	9'	2'	14'	2′	50′	2.7'	15′	2′	31′	3.3	10'	2'	13′				
SAND OR C GRAVEL M145 SOIL S A-2-4	30	3.7'	10'	2'	14'	2′	50′	2.8'	15′	2'	31′	3.4	6'	2'	7′	3′	10′	2'	17′
<u>≿</u> če≝⊀	36	4.2'	7′	2'	12'	2′	50′	2.8'	14′	2'	31′					3.3'	10'	2'	15′
dds∑~	42	4.2'	7′	2'	13′	2′	50′									3.2	11'	2′	20'
SILTY S SILTY (AASHTO M TYPES & A-2	48	4.5	6′	2′	12'	2'	30′									3.1	9′	2'	13'
	60	3.3	7′	2'	14'	2′	30′									2'	10'	2'	17′

MINIMUM COVER FOR CONSTRUCTION LOADS

NOMINAL PIPE DIA. (IN.)	MINIMUM COVER (FT) FOR INDICATED AXLE LOADS (THOUSANDS OF POUNDS)										
(111.7	18-50	50-75	75-110	110-150							
12-36	2.0	2.5	3.0	3.0							
42-60	3.0	3.0	3.5	4.0							

MINIMUM COVER LIMITS ARE NOT SUFFICIENT FOR SILTY SAND OR SILTY GRAVEL STRUCTURAL BACKFILL COMPACTED TO 90% STANDARD PROCTOR DENSITY. THE CONTRACTOR SHALL PROVIDE MINIMUM COVER PLUS ANY ADDITIONAL COVER REQUIRED TO AVOID DAMAGE TO THE PIPE. IN UNPAVED SITUATIONS, THE SURFACE MUST BE MAINTAINED TO A LEVEL AND NON-RUTTED CONDITION.



ON YIELDING SOIL, PIPE CULVERTS SHALL BE PLACED ON A CAMBERED FLOW LINE. THE AMOUNT OF CAMBER WILL VARY WITH SOIL CONDITION AND WILL BE SPECIFIED ON THE DESIGN PLANS.

TYPICAL CAMBERED FLOW LINE

NOTE:

SPD = STANDARD PROCTOR DENSITY.

FILL HEIGHT MEASURED FROM THE TOP OF PIPE TO SURFACE.

LIMITS ACCOUNT FOR SHORT-TERM TEMPORARY WATER TABLE DEPTHS OF FIVE FEET ABOVE SPRINGLINE. TABLES ARE NOT APPLICABLE FOR LONG-TERM PERMANENT WATER TABLE DEPTHS ABOVE SPRINGLINE.

WHEN PIPES ARE USED AS GROUP A. FILL HEIGHTS ARE LIMITED TO SHADED VALUES.

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MODOT

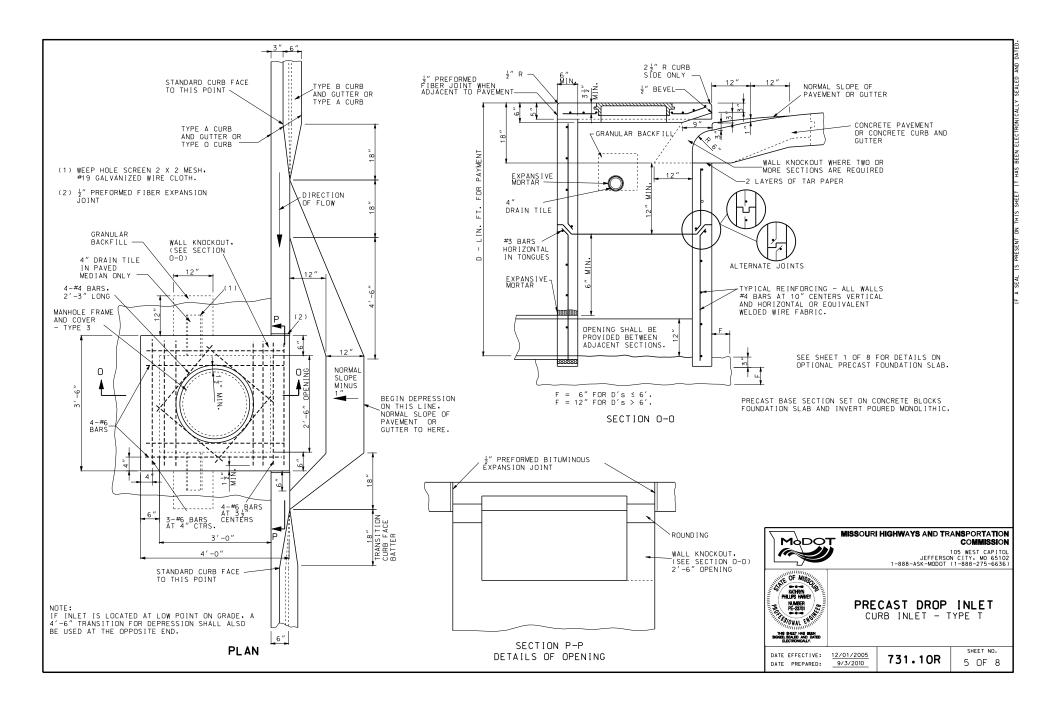
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THERMOPLASTIC PIPE INSTALLATION **METHODS**

DATE EFFECTIVE: 04/01/2015 DATE PREPARED: 2/27/2015

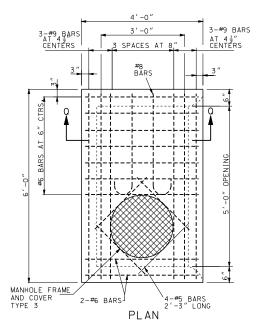
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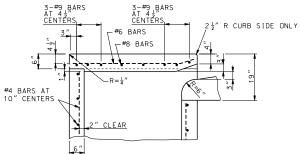
SHEET NO. 1 OF 1



LID FOR ADJACENT SECTIONS

UPSTREAM SECTIONS.





SECTION Q-Q

OPTIONAL PRECAST CURB INLET 5'-0" OPENING

OTHER DETAILS ARESAME AS FOR THE 2'-6" OPENING DROP INLET THIS SHEET.

GENERAL NOTES:

NOTES PERTAINING TO TYPE T:

THE LENGTH AND DEPTH OF THE INLET SHALL BE AS SHOWN ON THE PLANS.

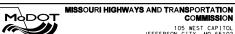
WALLS BETWEEN THE ADJACENT SECTIONS SHALL BE SEALED IN ACCORDANCE WITH SECTION 726.3.1 OF THE STANDARD SPECIFICATIONS.

IF DEPTH OF INLET EXCEEDS 6 FEET THE PRECAST UNITS MAY BE FURNISHED IN TWO OR MORE SECTIONS.

IF TWO OR MORE SECTIONS ARE USED. THE TYPE 3 MANHOLE FRAME AND COVER SHALL BE IN THE DOWNSTREAM SECTION

IF A 5 FOOT OPENING IS REQUIRED. TWO 2'-6" OPENING SECTIONS OR ONE 5 FOOT OPEING SECTION MAY BE PROVIDED AT THE CONTRACTOR'S OPTION.

SEE SHEET 1 FOR STEP DETAILS AND SHEET 4 FOR GENERAL NOTES.



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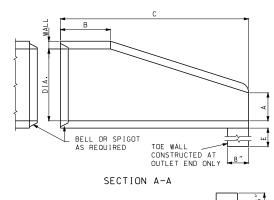
PRECAST DROP INLET CURB INLET - TYPE T

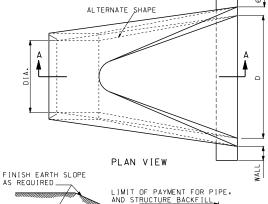
DATE EFFECTIVE: 12/01/2005 DATE PREPARED: 9/3/2010

731.10R

6 OF 8

SHEET NO.





LFLARED END SECTION 7

INSTALLATION DETAILS

L_{CULVERT}

	DIMENSIONS									
DIA.	WALL	Α	B MIN.	C MIN.	D	Е				
12"	2 "	4"	4′-0″	6′	2'-0"	18"				
15"	2 ¼"	6"	3'-10"	6′	2'-6"	18"				
18"	2 ½"	9"	3'-10"	6′	3'-0"	18"				
21"	2 3 "	9"	3'-2"	6′	3′-6″	18"				
24"	3″	9 ½"	2'-6"	6′	4'-0"	24"				
27"	3 ¼"	10½"	2'-1"	6′	4'-6"	24"				
30"	3 ½"	1'-0"	1'-7"	6′	5'-0"	24"				
33"	3 3 "	1'-2"	1'-7"	6′	5′-6″	24"				
36"	4 "	1′-3″	2'-10"	8′	6'-0"	24"				
42"	4 ½"	1'-9"	2'-11"	8′	6'-6"	24"				
48"	5″	2'-0"	2'-2"	8′	7′-0″	24"				
54"	5 ½"	2'-3"	2'-11"	8′	7′-6″	36"				
60"	6"	2′-6″	3′-3″	8′	8′-0″	36"				
66"	6 ½"	2'-0"	1'-9"	8′	8′-6″	36"				
72"	7 "	2'-0"	2'-9"	10'	9'-0"	36"				
78"	7 ½"	2'-3"	2'-3"	10'	9'-6"	36"				
84"	8 "	2'-6"	2'-0"	10'	10'-0"	36"				

RE I NF ORCE MENT										
		RREL SECT	FLARE SECTION REINFORCEMENT (ONE LAYER ONLY							
ADJOINING PIPE DIA.	CIRC	ULAR	ELLIPTICAL	IN CENTER OF WALL)						
	INNER CAGE SQ. IN./ LIN. FT.	OUTER CAGE SQ. IN./ LIN. FT.	SQ. IN./ LIN. FT.	AREA OF LONGITUDINAL TRANSVERS SO. IN./ LIN. FT.						
12"	0.07			0.048	0.048					
15"	0.07			0.054	0.054					
18"	0.07		0.07	0.060	0.060					
21"	0.07		0.07	0.066	0.066					
24"	0.07		0.07	0.072	0.072					
27"	0.13		0.11	0.078	0.078					
30"	0.14		0.12	0.084	0.084					
33"	0.15		0.13	0.090	0.090					
36″	0.12	0.09	0.13	0.096	0.096					
42"	0.15	0.12	0.17	0.108	0.108					
48"	0.18	0.14	0.20	0.120	0.120					
54"	0.22	0.16	0.24	0.132	0.132					
60"	0.25	0.19	0.28	0.144	0.144					
66"	0.31	0.23	0.34	0.156	0.156					
72"	0.35	0.21	0.39	0.170	0.170					
78″	0.40	0.24	0.44	0.185	0.185					
84"	0.46	0.28	0.51	0.205	0.205					

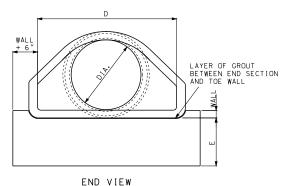
GENERAL NOTES:

SLIGHT VARIATIONS IN BOTH SHAPE AND DIMENSIONS FROM THOSE SHOWN MAY BE ACCEPTED IF APPROVED BY THE ENGINEER.

NOT MORE THAN THREE LIFT HOLES MAY BE DRILLED OR CAST IN THE END SECTION FOR HANDLING AND LAYING.

LIFT LUGS OR BARS WILL BE PERMITTED IN PRECAST TOE

TOE WALLS MAY BE CAST-IN-PLACE OR PRECAST.



NUMBER PE-28751 PE-28751

KATHRYN PHILLIPS HARVEY

MODOT

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FLARED END SECTION

PRECAST CONCRETE

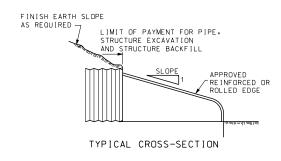
DATE EFFECTIVE: 06/01/2013 DATE PREPARED:

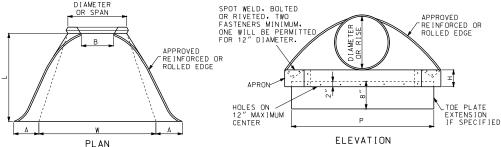
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SHEET NO. 1 OF 3

	END SECTIONS FOR ARCH PIPE											
				DIAMETER EQUIVALENT			IMENSIO		TOE PLATE IF SPECIFIED P.			
	IIFE		DIMENSIONS SPAN × RISE	ROUND PIPE IN.	SHEET THICK IN.	A 1″ TOL.	B MAX.	H 1″ TOL.	l 1½″ TOL.	₩ 2″ TOL.	(V:H) (1:SLOPE)	(IN.)
	В1			15	.064	6	9	6	19	30	2 	40
	В2			18	.064	7	11	6	23	36	2	46
	В3			21	.064	8	12	6	28	42	2 1/8	52
	В4		SEE	24	.064	8	16	6	32	48	2	58
	В5		STANDARD	30	.079	10	16	6	39	60	1 7/8	70
В6	OR	B6A	PLAN 725.00	36	.079	12	18	8	46	75	1 3	85
В7	OR	В7А	123.00	42	.109	13	21	9	53	85	1 7/8	107
В8	OR	В8А		48	.109	18	26	12	63	90	1 7 8	112
В9	OR	B9A		54	.109	18	30	12	70	102	1 7/8	124
B10	OR	B10A		60	.109	18	33	12	77	114	1 7/8	136
B11	OR	B11A		66	.109	18	36	12	77	126	1 %	148
B12	OR	B12A		72	.109	18	39	12	77	138	1 ½	160

END SECTIONS FOR ROUND PIPE									
PIPE	GAL VAN I ZED SHEET		DIN	ENS I ONS	APPROXIMATE SLOPE		ΙF		
DIAMETER (IN.)	THICK (IN.)	A 1″ TOL.	B MAX.	H 1″ TOL.	1 ½" TOL.	₩ 2″ TOL.	(V:H) (1:SLOPE)	SPECIFIED F	٠,
12	.064	6	6	6	21	24	2 ½	34	
15	.064	7	8	6	26	30	2 ½	40	
18	.064	8	10	6	31	36	2 ½	46	
21	.064	9	12	6	36	42	2 ½	52	
24	.064	10	13	6	41	48	2 ½	58	
30	.079	12	16	8	51	60	2 ½	70	
36	.079	14	19	9	60	72	2 ½	94	
42	.109	16	22	11	69	84	2 ½	106	
48	.109	18	27	12	78	90	2 ½	112	
54	.109	18	30	12	84	102	2 OR 2 4	124	
60	.109	18	33	12	87	114	1 4 OR 2	136	
66	.109	18	36	12	87	120	1 ½ OR 2	144	
72	.109	18	39	12	87	126	1 1 OR 2	148	
78	.109	18	42	12	87	132	1 4 OR 1 ½	154	
84	.109	18	45	12	87	138	1 to OR 1 to	160	





END SECTION FOR PIPE AND PIPE ARCH

MINOR VARIATIONS OF DETAIL AND DIMENSIONS WILL BE ACCEPTED TO PERMIT THE USE OF A MANUFACTURER'S STANDARD METHODS OF FABRICATION.

END SECTIONS FABRICATED FROM THICKER METAL THAN INDICATED WILL BE ACCEPTED.

ALL BOLTS SHALL BE 3 DIAMETER AND GALVANIZED. UNLESS OTHERWISE SHOWN.

TOE PLATE EXTENSIONS, IF SPECIFIED, SHALL HAVE HOLES TO MATCH HOLES IN TOE PLATE.

SKIRT SECTION IS DEFINED AS THE FLARED PORTION OF THE END SECTION INCLUDING SIDE AND BOTTOM (CENTER) PANELS AND APRON.

SKIRT SECTION FOR 12" THROUGH 24" PIPES SHALL BE MADE IN ONE PIECE.

SKIRT SECTIONS FOR 30" AND LARGER PIPES AND B5 AND LARGER PIPE ARCHES MAY BE MADE FROM UP TO 2 SHEETS JOINED BY RIVETING OR BOLTING ON CENTERLINE.

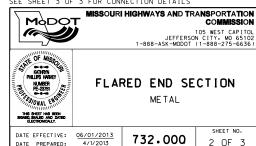
SKIRT SECTIONS FROM 48" AND LARGER PIPES AND B8 OR LARGER PIPE ARCHES MAY BE MADE FROM UP TO 3 SHEETS JOINED BY RIVETING OR BOLTING EQUAL DISTANCE FROM CENTERLINE.

SKIRT SECTIONS FOR 72" AND LARGER PIPES MAY BE MADE FROM UP TO 4 SHEETS JOINED BY RIVETING AND BOLTING. THE BOTTOM PANEL SHALL BE 2 EQUAL WIDTH SHEETS JOINED ON CENTERLINE.

ALL 3 PIECE AND 4 PIECE SKIRTS FOR 60" OR LARGER PIPES AND B10 AND LARGER PIPE ARCHES SHALL HAVE 0.109" THICK SIDES AND 0.138" THICK BOTTOM (CENTER) PANELS. WIDTH OF BOTTOM PANELS SHALL BE GREATER
THAN 20% OF THE PIPE PERIPHERY CONNECTOR SECTIONS. CORNER PLATES AND TOE PLATES SHALL BE GALVANIZED AND OF THE SAME OR GREATER THICKNESS AS THE SKIRT.

SEE SHEET 3 OF 3 FOR CONNECTION DETAILS

DATE PREPARED:



MAINTAIN INSIDE DIAMETER OF SLEEVE. FINISHED END TO BE THE SAME DIAMETER AS CORRUGATED STEEL PIPE DIAMETER.

SMOOTH TAPERED SLEEVE DETAIL

PIPE DIAMETER PIPE DIAMETER APPLY JOINT SEALANT WHEN REQUIRED Ņ. SEE SMOOTH TAPER SLEEVE DETAIL PIPE PAY LIMIT CORRUGATION OR LIP CAPABLE OF SECURE CONNECTION OF THE APPROPRIATE TYPE HALF SECTION HALF SECTION (CONCRETE) (POLYETHELENE

> TAPERED SLEEVE CONNECTION FOR CONCRETE AND THERMOPLASTIC PIPE

TAPERED SLEEVE SHALL BE FIRMLY WEDGED INTO PIPE END BEFORE BACKFILLING PIPE PAY LENGTH.

PIPE THREADED RUD ROD HOLDER

PΕ

N

N

N

N

N

N

FOR 30" THRU 48" PIPE AND EQUIVALENT PIPE ARCH TYPE 2 CONNECTION

CONNECTOR SECTION RIVETED OR BOLTED

POLYURE THANE)

PERMISSIBLE FOR ALL SIZES TYPE 3 CONNECTION



AND 6" x ½" GALVANIZED BAND BOLT AND NUT. USE AS ALTERNATE ON TYPE 1 CONNECTION ONLY.

1 INCH WIDE, 0.109" THICK

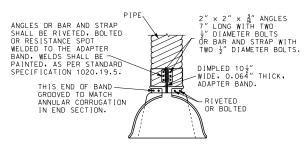
COMMERCIAL QUALITY STEEL.

CONNECTOR STRAP OF

GALVANIZED WITH SAME

WEIGHT COATING AS PIPE.

CONNECTOR STRAP



CONNECTION REQUIREMENTS

SIZE

(IN.)

ALL

12-24

12-24

ALL

ALL

12-24

12-24

12-24

PIPE

CONNECTOR

CONNECTION

6

2

3

4

5

6

TYPE

SAFFTY

END SECTION

MF TAI

END

SECTION

FOR 12" THRU 24" ROUND PIPE ONLY

TYPE 1 CONNECTION

THREADED

ROD

ALLOWABLE TAPERED SLEEVE REQUIREMENT

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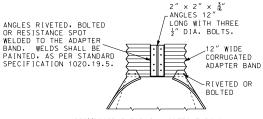
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FOR 12" THRU 42" PIPE AND EQUIVALENT PIPE ARCH TYPE 4 CONNECTION



PERMISSIBLE FOR ALL SIZES THROUGH 84" PIPE AND B-12 OR B-12A PIPE ARCH TYPE 5 CONNECTION

END SECTION FOR PIPE AND PIPE ARCH

GENERAL NOTES:

MINOR VARIATIONS OF DETAIL AND DIMENSIONS WILL BE ACCEPTED TO PERMIT THE USE OF A MANUFACTURER'S STANDARD METHODS OF FABRICATION.

TAPERED SLEEVES SHALL BE FABRICATED FROM SMOOTH 12 GUAGE STEEL COATED IN ACCORDANCE WITH AASHTO M-218.

TAPERED SLEEVES SHALL BE FIRMLY WEDGED INTO THE PIPE END BEFORE BACKFILLING PIPE PAY LENGTH.

THE LENGTH OF TAPERED SLEEVE SHALL BE SIZED TO PROTECT UV SENSITIVE PIPE MATERIALS FROM SUNLIGHT. THE ENTIRE COST OF THE TAPERED SLEEVE. HARDWARE, AND INSTALLATION SHALL BE INCLUDED IN THE COST OF THE PIPE.

TAPERED SLEEVES SHALL HAVE AT A MINIMUM A HALF CORRUGATION OR LIP DESIGNED TO PROVIDE A SECURE CONNECTION WITH THE END SECTION.

ANY ROD OR STRAP USED FOR MAKING A CONNECTION SHALL BE SECURLY SEATED INTO A VALLEY OF THE PIPE CORRUGATION. THE VALLEY CHOOSEN TO HOLD THE ROD OR STRAP SHALL LEAVE AT LEAST ONE FULL INTACT CORRUGATION BEFORE THE END OF THE PIPE.
THE FEMALE PORTION OF A BELL END SHALL NOT COUNT AS A FULL INTACT CORRUGATION.



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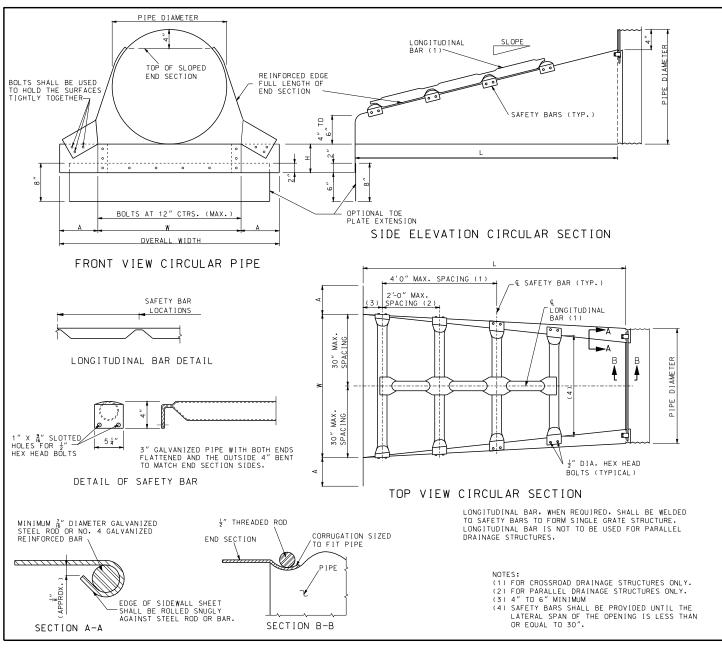
FLARED END SECTION

METAL

DATE EFFECTIVE: 02/01/2009 DATE PREPARED:

732.000

SHEET NO. 3 OF 3



END SECTIONS, INCLUDING ALL BOLTS, NUTS, RODS AND STRAPS, SHALL BE FABRICATED FROM GALVANIZED STEEL MEETING THE REQUIREMENTS OF SECTION 1020.

ALL BOLTS UNLESS OTHERWISE SHOWN SHALL BE A307 BOLTS.

WHEN REQUIRED. OPTIONAL TOE PLATE EXTENSION SHALL BE PUNCHED OR DRILLED AND BOLTED TO END SECTION TOE PLATE, STEEL FOR TOE PLATE EXTENSION SHALL BE SAME GAUGE AS END SECTION. DIMENSIONS SHALL BE OVERALL WIDTH LESS 6' BY 8" HIGH.

ATTACHMENT TO CIRCULAR PIPES 15" THROUGH 24" DIAMETER SHALL BE MADE WITH TYPE #1 STRAPS. ALL OTHER SIZES SHALL BE ATTACHED WITH TYPE #2 CONNECTORS.

SAFETY BARS AND LONGITUDINAL BARS SHALL BE FABRICATED FROM STEEL PIPE MEETING THE REQUIREMENTS OF ASTM A-53 SCHEDULE 40 SPECIFICATIONS. SAFETY BARS AND LONGITUDINAL BARS SHALL BE HOT DIPPED GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH SECTION 1020 OF STANDARD SPECIFICATIONS.

INSTALLATION SHALL BE PERFORMED IN ACCORDANCE WITH SECTION 725 AND 732 OF THE STANDARD SPECIFICATIONS.

SLOTTED HOLES FOR SAFETY BAR ATTACHMENT SHALL BE PROVIDED FOR ALL END SECTIONS.

MINOR VARIATIONS OF DETAIL WILL BE ACCECTED TO PERMIT THE USE OF A MANUFACTURER'S STANDARD METHODS OF FARRICATION.

END SECTIONS FABRICATED FROM THICKER METAL THAN INDICATED WILL BE ACCEPTED.

ALL BOLTS SHALL BE $\frac{3}{8}$ " DIAMETER AND GALVANIZED. UNLESS OTHERWISE SHOWN.

SKIRT SECTION IS DEFINED AS THE FLARED PORTION OF THE END SECTION INCLUDING SIDE AND BOTTOM (CENTER) PANELS AND APRON.

SKIRT SECTION FOR 12" TROUGH 24" PIPES SHALL BE MADE IN ONE PIECE.

SKIRT SECTIONS FOR 30" AND LARGER PIPES MAY BE MADE FROM UP TO 2 SHEETS JOINED BY RIVETING OR BOLTING ON CENTERLINE.

SKIRT SECTIONS FROM 48" AND LARGER PIPES MAY BE MADE FROM UP TO 3 SHEETS JOINED BY RIVETING OR BOLTING EQUAL DISTANCE FROM CENTERLINE.

ALL 3 PIECE SKIRTS FOR 60" PIPES SHALL HAVE 0.109" THICK SIDES AND 0.138" THICK BOTTOM (CENTER) PANELS. WIDTH OF BOTTOM PANELS SHALL BE GREATER THAN 20% OF THE PIPE PERIPHERY CONNECTOR SECTION. CORNER PLATES AND TOE PLATES SHALL BE GALVANIZED AND OF THE SAME OR GREATER THICKNESS AS THE SKIRT.



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SAFETY SLOPE END SECTION

DATE EFFECTIVE: 06/01/2013 DATE PREPARED:

732.10H

SHEET NO. 1 OF 3

PIPE END DETAILS FOR DRAINAGE STRUCTURES

(SINGLE PIPE INSTALLATION)

NOTE: SEE DRIVEWAY STANDARD PLANS FOR BEVELED END SECTION REQUIREMENT.

FOR CONNECTION DETAILS. SEE 732.00 SHEET 3 OF 3.

	METAL END SECTIONS FOR CIRCULAR PIPES											
PIPE	MIN. GAUGE	MIN. GAUGE	DIME	NSIONS I	N INCHES	5	L DIMENSIONS					
DIA.	ENDS (IN.)		Α	Н	W	OVERALL	SLOPE	LENGTH	SLOPE	LENGTH	SLOPE	LENGTH
(IN.)	4:1 & 6:1	10:1	1" TOL.	1" TOL.	2" TOL.	WIDTH		(IN.)		(IN.)		(IN.)
15	16	12	8	6	21	37	4:1	20	6:1	30	10:1	70
18	16	12	8	6	24	40	4:1	32	6:1	48	10:1	100
21	16	12	8	6	27	43	4:1	44	6:1	66	10:1	130
24	16	12	8	6	30	46	4:1	56	6:1	84	10:1	160
30	12		12	9	36	60	4:1	80	6:1	120	10:1	220
36	12		12	9	42	66	4:1	104	6:1	156	10:1	280
42	12		16	12	48	80	4:1	128	6:1	192		
48	12]	16	12	54	86	4:1	152	6:1	228		
54	12]	16	12	60	92	4:1	176	6:1	264		
60	12		16	12	66	98	4:1	200	6:1	300		



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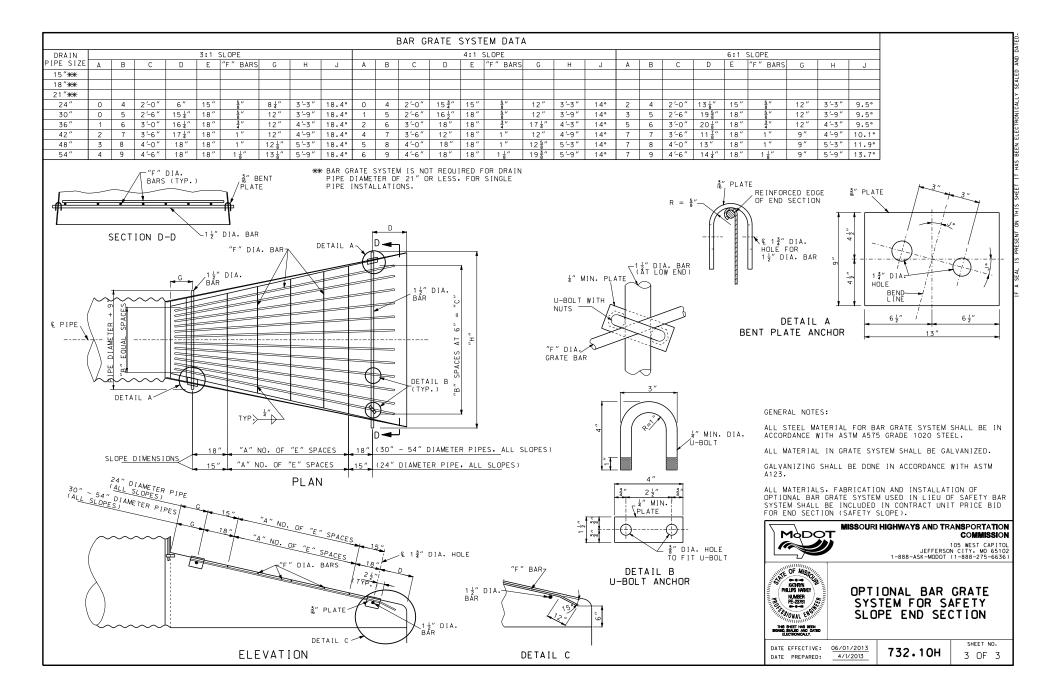


SAFETY SLOPE END SECTION

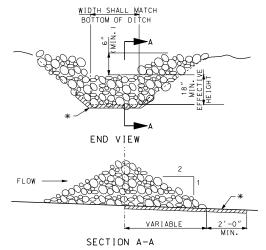
DATE EFFECTIVE: 06/01/2013 DATE PREPARED: 4/1/2013

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SHEET NO. 2 OF 3



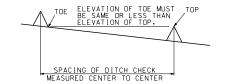
ROCK DITCH CHECK



* GEOTEXTILE LINING MAY BE INSTALLED AS REQUIRED BY THE ENGINEER.

ROCK DITCH CHECK IN THE CLEAR ZONE SHALL BE REMOVED OR LEVELED (IF ALLOWABLE) AFTER THE VEGETATION HAS SUFFICIENTLY MATURED TO PROTECT THE DITCH OR SWALE.

EXAMPLE										
DITCH CHECK SPACING										
FOR STANDARD HEIGHTS										
(FT.)										
DITCH & SLOPE %	SPACING FOR	SPACING FOR 18" EFF, HEIGHT								
0.5	150	300								
1.0	75	150								
1.5	50	100								
2.0	37	75								
2.5	30	60								
3.0	25	50								
3.5	21	43								
4.0	19	38								
4.5	16	33								
5.0	15	30								
5.5	13	27								
6.0	12	25								
6.5	11	23								
7.0	10	21								
7.5	10	20								
8.0	9	19								
8.5	9	18								
9.0	8	17								
9.5	8	16								
10.0	7	15								



MINIMUM DITCH CHECK SPACING

12" (MIN.) DOWNSLOPE STAKE UPSLOPE STAKE -EROSION SHANKET BLANKET FLOW

(MIN.)

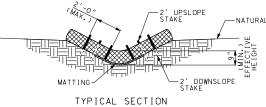
ALTERNATE DITCH CHECK



SECTION B-B

PLAN VIEW

(MIN.)



VEE DITCH

2' UPSLOPE STAKE -NATURAL GROUND -2' DOWNSLOPE STAKE MATTING-

TYPICAL SECTION TRAPEZOIDAL DITCH

NOTES:

USE MINIMUM 12 IN. DIAMETER LOG/SOCK.

USE 2 FT. WOODEN STAKES WITH A 2 IN. BY 2 IN. NOMINAL CROSS SECTION.

INSTALL LOG/SOCK TO A HEIGHT IN DITCH SO FLOW WILL NOT WASH AROUND LOG/SOCK AND SCOUR DITCH SLOPES OR AS DIRECTED BY ENGINEER.

INSTALL A MINIMUM OF 2 UPSLOPE STAKES AND 4 DOWNSLOPE STAKES AT AN ANGLE TO WEDGE LOG/SOCK TO BOTTOM OF DITCH.

EROSION CONTROL BLANKET SHALL BE ANCHORED ACCORDING TO THE MANUFACTURER'S RECOMMENDATIONS.

GENERAL NOTES:

OTHER PROPRIETARY DITCH CHECKS MAY BE SUBSTITUTED IN ACCORDANCE WITH SEC 806 OR AS DIRECTED BY THE ENGINEER.

INSTALLATION OF PROPRIETARY DITCH CHECKS SHALL BE ACCORDING TO THE MANUFACTURER'S RECOMMENDATIONS.



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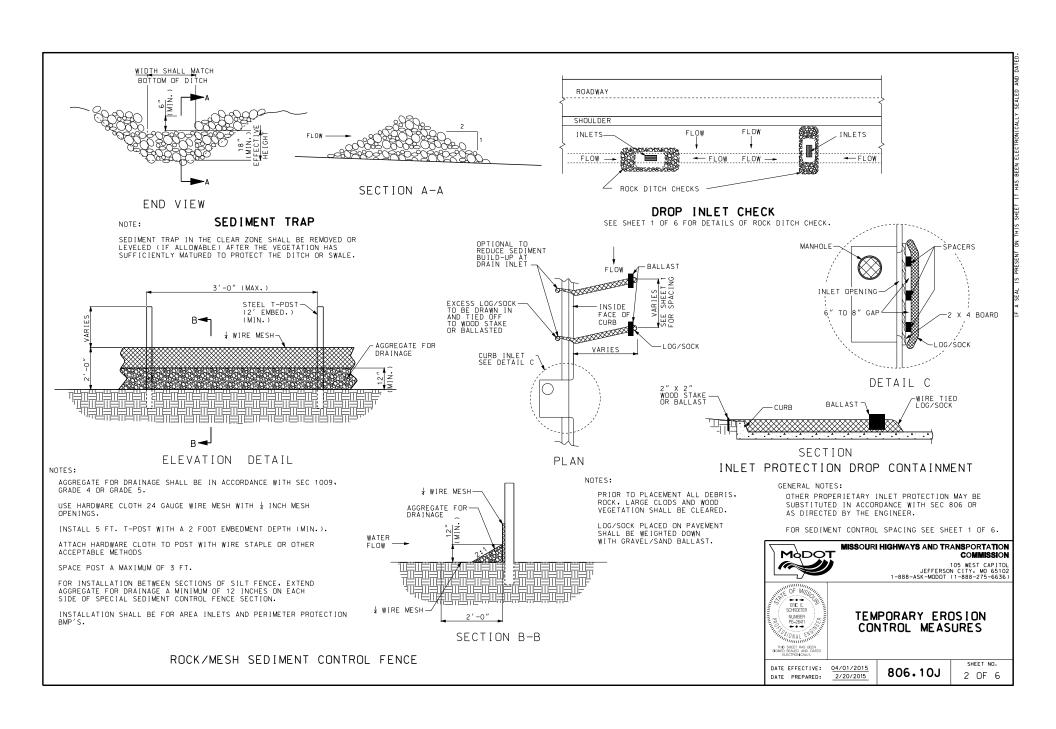
TEMPORARY EROSION CONTROL MEASURES

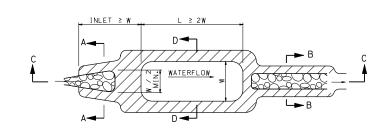
TEMPORARY DITCH CHECKS

DATE EFFECTIVE: 04/01/2015 DATE PREPARED: 2/20/2015

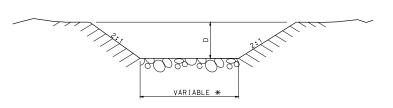
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SHEET NO. 1 OF 6





PLAN VIEW

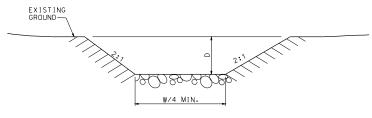


SECTION A-A

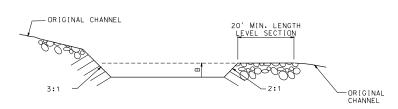
INLET

D = 1.0' + DESIGN FLOW DEPTH-MIN.

* VARIES FROM WIDTH OF STREAM AT INLET TO ONE-HALF WIDTH OF POND AT OUTLET.

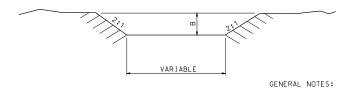


SECTION B-B OUTLET



SECTION C-C

EFFECTIVE DEPTH "B" = MIN. 2', MAX. 6' DEPENDENT UPON CONFIGURATION REQUIRED BY LOCATION AND ESTIMATED VOLUME.



SECTION D-D

LAYER OF APPROVED STABILIZING MATERIAL FOR SCOUR PREVENTION

SEDIMENT BASINS ARE TO BE INCLUDED IN THE BMP SYSTEM WHEN THE GEOMETRY OF RIGHT-OF-WAY ALLOWS. WHERE INCLUDED, SEDIMENT BASINS ARE TO BE DESIGNED AND CONSTRUCTED TO PROVIDE STORAGE VOLUME FOR THE LOCAL CONSTRUCTED TO PROVIDE STORAGE VOLUME FOR THE LUCAL 2-YR. 24-HOUR STORM FOR DISTURBED ACREAGE DRAINING TO THEM. IF THE DESIGN STORM VOLUME HAS NOT BEEN CALCULATED. BASINS ARE TO BE DESIGNED AND CONSTRUCTED TO PROVIDE A STORAGE VOLUME OF AT LEAST 3.600 CUBIC FEET PER DISTURBED ACRE DRAINING TO THE BASIN(S).

IF SEDIMENT BASIN IS TO BE PERMANENT ITS SLOPES SHALL BE STABILIZED WITH ROCK RIPRAP OR EQUIVALENT.

THE MATERIALS FOR ROCK RIPRAP SHALL MEET THE RE-QUIREMENTS OF SEC 611.30 FOR TYPE 2 ROCK BLANKET.

SEE PLANS FOR LENGTH. DEPTH AND WIDTH OF BASIN.

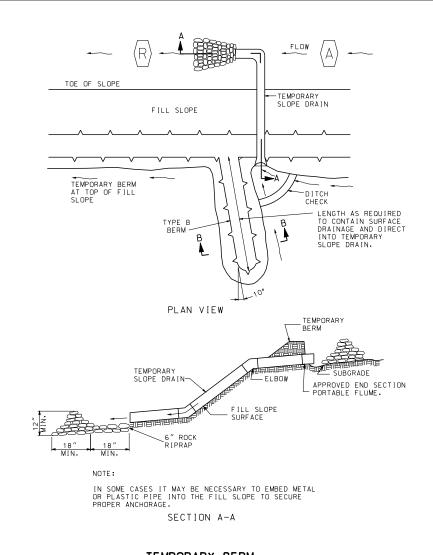
SEE PLANS FOR ESTIMATED QUANTITIES OF ROCK RIPRAP - CUBIC YARDS.



DATE EFFECTIVE: 04/01/2015 DATE PREPARED: 2/20/2015

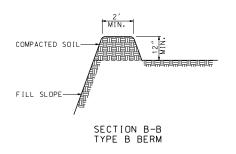
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3 OF 6



SHORT SECTION PIPE APPROVED END SECTION -FLOW DOWNDRAIN FILL SLOPE SURFACE PLAN VIEW SECTION VIEW

TEMPORARY SLOPE DRAIN INLET TREATMENT



TEMPORARY BERM

(METAL. FLEXIBLE RUBBER OR PLASTIC PIPE)

NOTE: MAXIMUM LENGTH BETWEEN SLOPE DRAINS SHALL BE APPROXIMATELY 500 FEET.





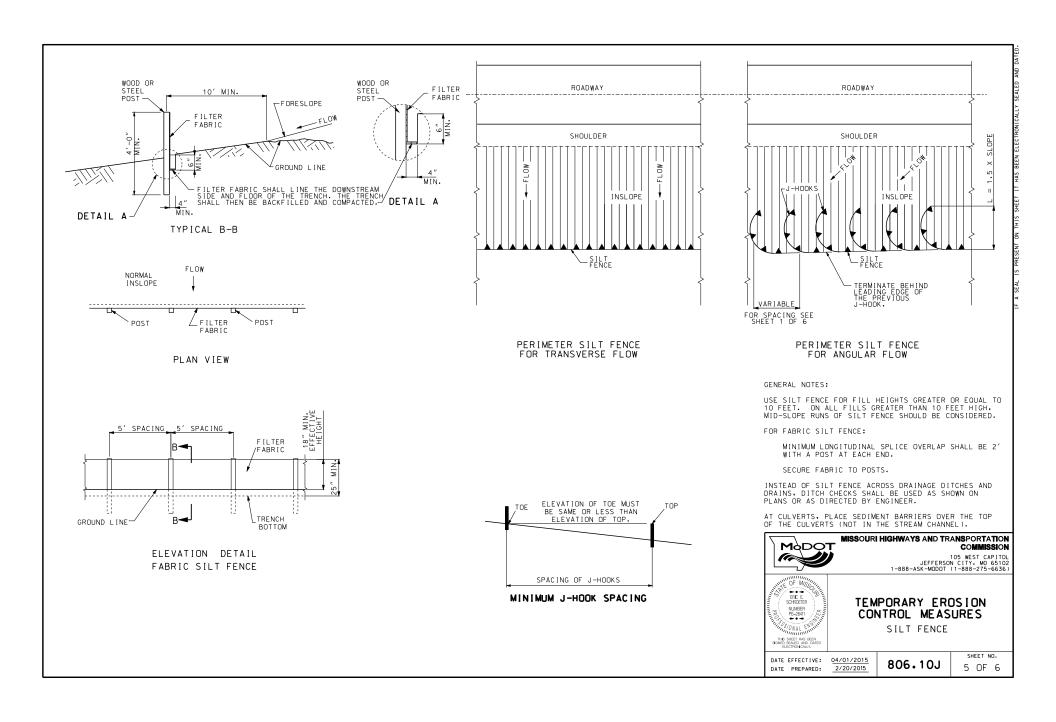
TEMPORARY EROSION CONTROL MEASURES

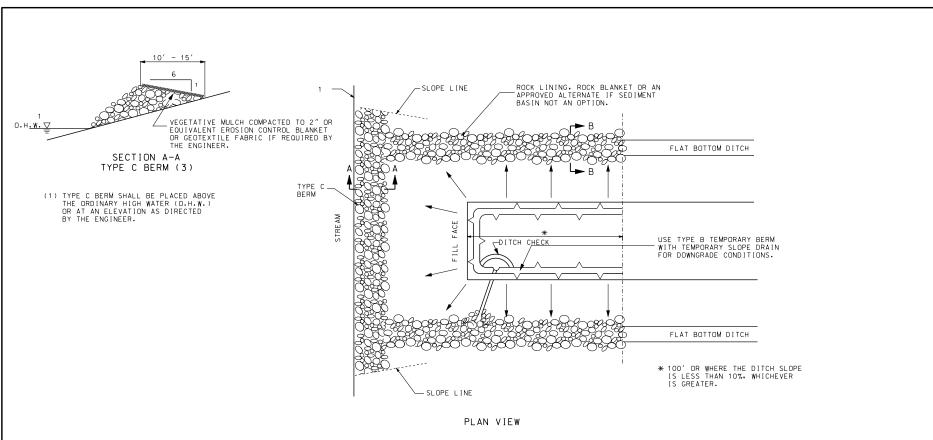
SLOPE DRAINS

DATE EFFECTIVE: 04/01/2015 DATE PREPARED: 2/20/2015

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SHEET NO. 4 OF 6

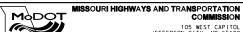






GENERAL NOTES:

TYPE C BERM SHALL BE BUILT TO HANDLE SIGNIFICANT RUN-OFF EVENTS AND SHALL BE INSTALLED PRIOR TO SOIL DISTURBANCE OR PLACEMENT OF FILL IN THE DRAINAGE AREA OF THE BERM.



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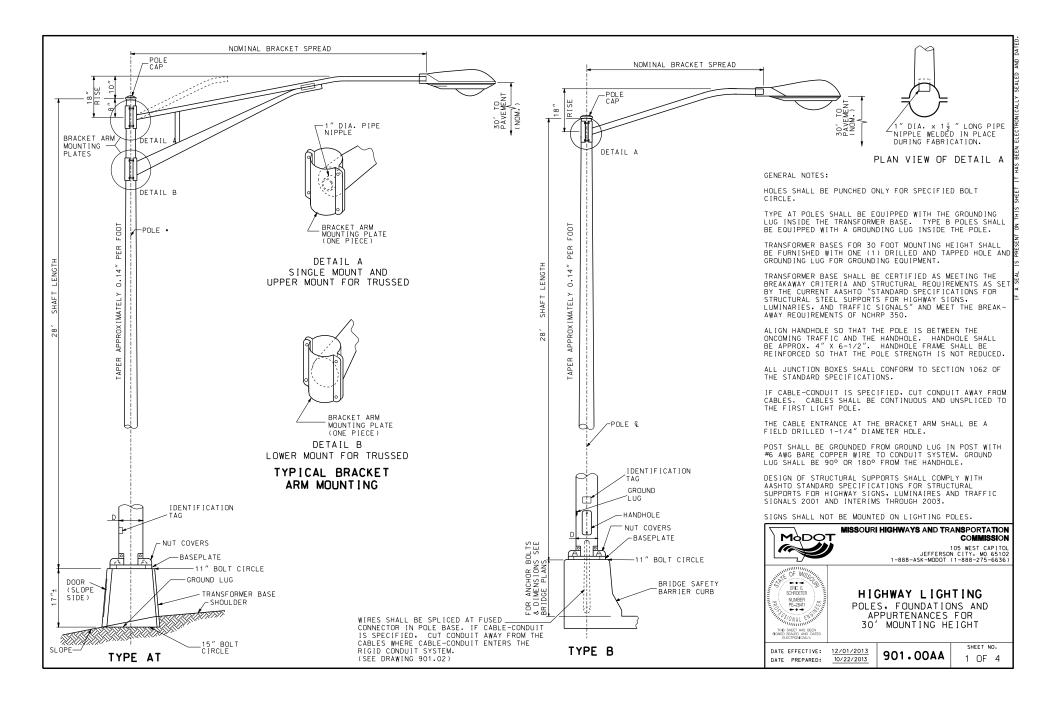
TEMPORARY EROSION CONTROL MEASURES

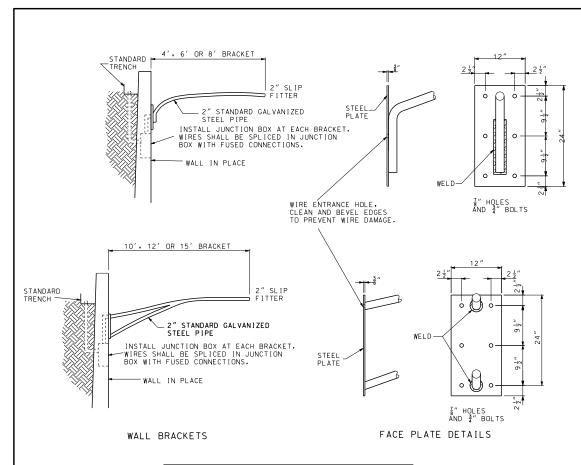
BRIDGES AND BOX CULVERTS AT STREAM CROSSINGS

DATE EFFECTIVE: 04/01/2015 DATE PREPARED: 2/20/2015

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SHEET NO. 6 OF 6

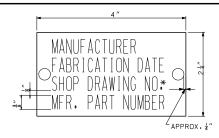




	ANSI LAMPS			
FUSE RATING	DESIGNATION		INITIAL	
	HPS	WATTS	LUMENS	
3 A	S55	150	16,000	
TYPE III MEDIUM DISTRIBUTION SEMI-CUTOFF UNLESS OTHERWISE SPECIFIED ON PLANS				

TYPE AT POLE							
BRACKET	SPREAD			4'-10'	12′		15′
MAX. LU	MINAIRE	WEIGHT		75 LB	71 LE	3	66 LB
MAX. PROJECTED AREA 3.3 SQ. FT.					т.		
	SINGLE	AND TRUSSED E	BRA	CKET AR	MS		
LOCATION	LENGTH POLE	BRACKET SPREAD		TRANS. BASE BOLT CIRC.			D
SHOULDER	28′	4′.6′,8′. 10′.12°.15′	15"		8 "		

TYPE B POLE					
BRACKET SPRE	AD		4 ′	6′	8′
MAX. LUMINA	Т	75 LB	75 LB	54 LB	
MAX. PROJECT		3.3 SQ. FT.			
	SING	LE BRACKET A	.RM		
LOCATION	LENGTH POLE	BRACKET SPREAD	D		R BOLT
BRIDGE SAFETY BARRIER CURB	28′	4′•6′ 8′	8"		ı "



ID TAG NOTE: TAG SHALL BE ALUMINUM OR STAINLESS STEEL AND ATTACHED TO POLE USING TWO RIVETS OR STAINLESS STEEL DRIVE SCREWS.

* INCLUDING REVISION

IDENTIFICATION TAG

GENERAL NOTES:

HOLES SHALL BE PUNCHED ONLY FOR SPECIFIED BOLT CIRCLE.

TYPE AT POLES SHALL BE EQUIPPED WITH THE GROUNDING LUG INSIDE THE TRANSFORMER BASE. TYPE B POLES SHALL BE EQUIPPED WITH A GROUNDING LUG INSIDE THE POLE.

TRANSFORMER BASES FOR 30 FOOT MOUNTING HEIGHT SHALL BE FURNISHED WITH ONE (1) DRILLED AND TAPPED HOLE AND GROUNDING LUG FOR GROUNDING EQUIPMENT.

TRANSFORMER BASE SHALL BE CERTIFIED AS MEETING THE BREAKAWAY CRITERIA AND STRUCTURAL REQUIREMENTS AS SET BY THE CURRENT AASHTO "STANDARD SPECIFICATIONS FOR STRUCTURAL STEEL SUPPORTS FOR HIGHWAY SIGNS. LUMINARIES, AND TRAFFIC SIGNALS" AND MEET THE BREAK-AWAY REQUIREMENTS OF NCHRP 350.

ALIGN HANDHOLE SO THAT THE POLE IS BETWEEN THE ONCOMING TRAFFIC AND THE HANDHOLE. HANDHOLE SHALL BE APPROX. 4" X 6-1/2". HANDHOLE FRAME SHALL BE REINFORCED SO THAT THE POLE STRENGTH IS NOT REDUCED.

ALL JUNCTION BOXES SHALL CONFORM TO SECTION 1062 OF THE STANDARD SPECIFICATIONS.

IF CABLE-CONDUIT IS SPECIFIED. CUT CONDUIT AWAY FROM CABLES. CABLES SHALL BE CONTINUOUS AND UNSPLICED TO THE FIRST LIGHT POLE.

THE CABLE ENTRANCE AT THE BRACKET ARM SHALL BE A FIELD DRILLED 1-1/4" DIA. HOLE.

POST SHALL BE GROUNDED FROM GROUND LUG IN POST WITH #6 AWG BARE COPPER WIRE TO CONDUIT SYSTEM. GROUND LUG SHALL BE 90° OR 180° FROM THE HANDHOLE.

ID TAG HOLES SHALL BE DRILLED INTO POLE PRIOR TO GALVANIZING.



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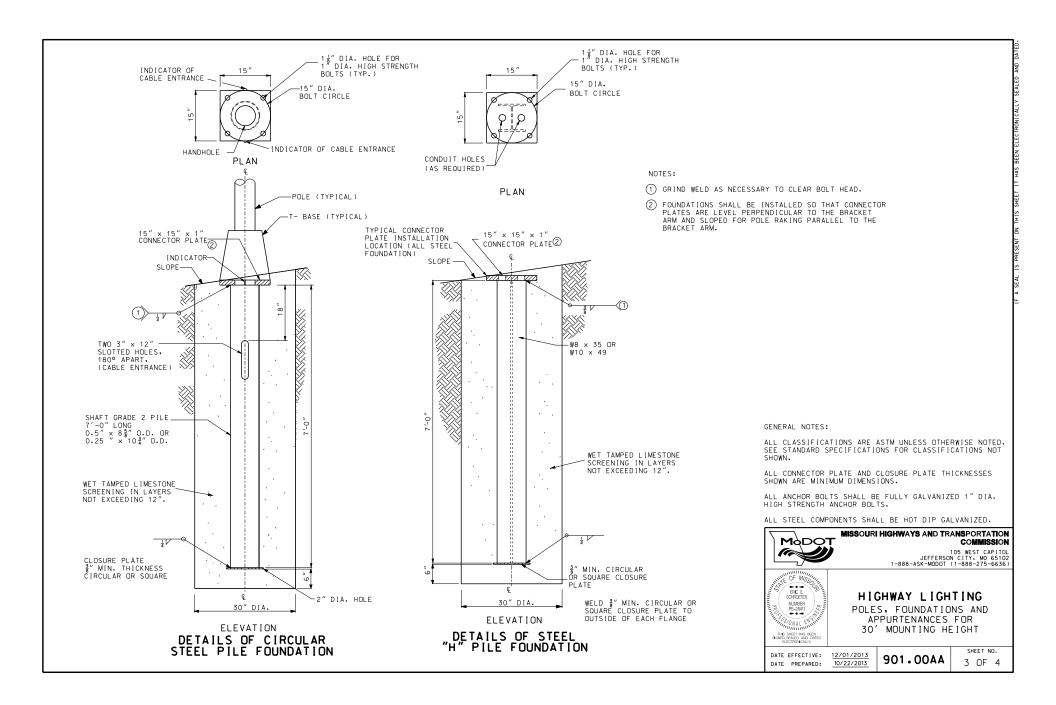
HIGHWAY LIGHTING POLES, FOUNDATIONS AND APPURTENANCES FOR 30' MOUNTING HEIGHT

DATE EFFECTIVE: 12/01/2013 DATE PREPARED:

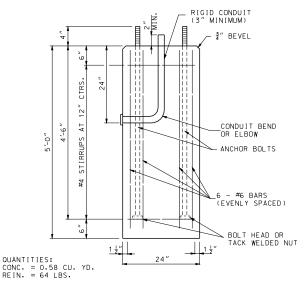
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2 OF 4

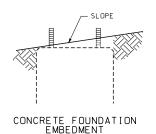
SHEET NO.

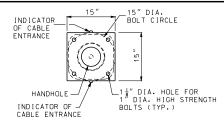


PLAN

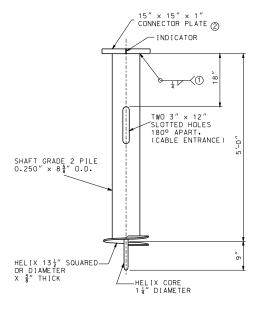


ELEVATION DETAILS OF CONCRETE FOUNDATION 3



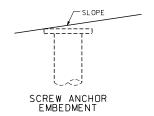


PLAN



ELEVATION

DETAILS OF SCREW ANCHOR FOUNDATION



DRIVE HOLES WILL BE PERMITTED PROVIDED THAT THEY DO NOT CONFLICT WITH OR COMPROMISE THE STRUCTURAL INTEGRITY OF THE PLATE, THE WELD BETWEEN THE PLATE AND SHAFT, OR THE BOLT HOLES.

NOTES:

- (1) GRIND WELD AS NECESSARY TO CLEAR BOLT HEAD.
- 2) FOUNDATIONS SHALL BE INSTALLED SO THAT CONNECTOR PLATES ARE LEVEL PERPENDICULAR TO THE BRACKET ARM AND SLOPED FOR POLE RAKING PARALLEL TO THE BRACKET ARM.
- (3) AT THE OPTION OF THE CONTRACTOR THE CONCRETE FOUNDATION MAY BE PRECAST. IF PRECAST, THEY SHALL BE SET IN DRILLED HOLES 3 FEET IN DIAMETER AND 6 INCHES DEEPER THAN THE BOTTOM OF THE CONCRETE FOUNDATION. THE BOTTOM 6 INCHES OF THE HOLE AND THE REMAINING SPACE AROUND THE FOUNDATION SHALL BE BACKFILLED WITH WET TAMPED LIMESTONE SCREENINGS IN LAYERS NOT EXCEEDING

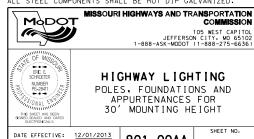
GENERAL NOTES:

ALL CLASSIFICATIONS ARE ASTM UNLESS OTHERWISE NOTED. SEE STANDARD SPECIFICATIONS FOR CLASSIFICATIONS NOT

ALL CONNECTOR PLATE AND CLOSURE PLATE THICKNESSES SHOWN ARE MINIMUM DIMENSIONS.

ALL ANCHOR BOLTS SHALL BE FULLY GALVANIZED 1" DIA. HIGH STRENGTH ANCHOR BOLTS.

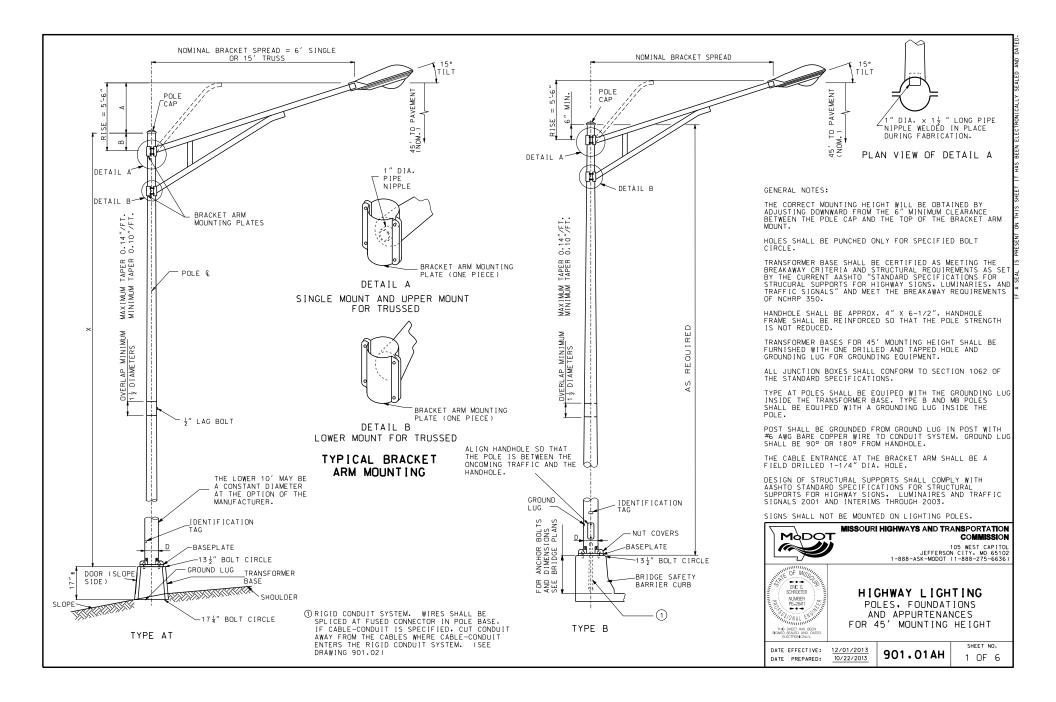
ALL STEEL COMPONENTS SHALL BE HOT DIP GALVANIZED.

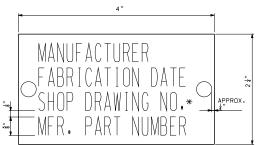


DATE PREPARED:

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IDENTIFICATION TAG

ID TAG NOTE:

TAG SHALL BE ALUMINUM OR STAINLESS STEEL AND ATTACHED TO POLE USING TWO RIVETS OR STAINLESS STEEL DRIVE SCREWS. ID TAG HOLES SHALL BE DRILLED PRIOR TO GALVANIZING.

* INCLUDING REVISION

GENERAL NOTES:

THE CORRECT MOUNTING HEIGHT WILL BE OBTAINED BY ADJUSTING DOWNWARD FROM THE 6" MINIMUM CLEARANCE BETWEEN THE POLE CAP AND THE TOP OF THE BRACKET ARM

HOLES SHALL BE PUNCHED ONLY FOR SPECIFIED BOLT CIRCLE.

TRANSFORMER BASE SHALL BE CERTIFIED AS MEETING THE BREAKAWAY CRITERIA AND STRUCTURAL REQUIREMENTS AS SET BY THE CURRENT AASHTO "STANDARD SPECIFICATIONS FOR STRUCURAL SUPPORTS FOR HIGHWAY SIGNS. LUMINARIES. AND TRAFFIC SIGNALS" AND MEET THE BREAKAWAY REQUIREMENTS OF NCHRP 350.

HANDHOLE SHALL BE APPROX. 4" X 6-1/2". HANDHOLE FRAME SHALL BE REINFORCED SO THAT THE POLE STRENGTH IS NOT REDUCED.

TRANSFORMER BASES FOR 45' MOUNTING HEIGHT SHALL BE FURNISHED WITH ONE DRILLED AND TAPPED HOLE AND GROUNDING LUG FOR GROUNDING EQUIPMENT.

ALL JUNCTION BOXES SHALL CONFORM TO SECTION 1062 OF THE STANDARD SPECIFICATIONS.

TYPE AT POLES SHALL BE EQUIPED WITH THE GROUNDING LUG INSIDE THE TRANSFORMER BASE. TYPE B AND MB POLES SHALL BE EQUIPED WITH A GROUNDING LUG INSIDE THE

POST SHALL BE GROUNDED FROM GROUND LUG IN POST WITH #6 AWG BARE COPPER WIRE TO CONDUIT SYSTEM. GROUND LUG SHALL BE 90° OR 180° FROM HANDHOLE.

THE CABLE ENTRANCE AT THE BRACKET ARM SHALL BE A FIELD DRILLED 1-1/4" DIA. HOLE.

SIGNS SHALL NOT BE MOUNTED ON LIGHTING POLES.

MISSOURI HIGHWAYS AND TRANSPORTATION MODOT COMMISSION (Ca)

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HIGHWAY LIGHTING POLES, FOUNDATIONS AND APPURTENANCES FOR 45' MOUNTING HEIGHT

DATE PREPARED:

DATE EFFECTIVE: 12/01/2013

901.01AH

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SHEET NO.

TYPE AT POLE						
BRACKET	SPREAD			6' OR 15'		
MAX. LL	MINAIRE WE	IGHT		60 LB		
MAX. PR	OJECTED AF	3.3 SQ. FT.				
AT-45 DESIGN NO.	х	А	В	* D (NOMINAL)		
1	50′	VAR.	6" MIN.	10"		
2	45′	VAR.	6" MIN.	10″		
3	40′	VAR.	6" MIN.	10"		
4	35′	VAR.	6" MIN.	10"		
5	30′	VAR.	6" MIN.	10"		

* THE MINIMUM ALTERNATE DIAMETER SHALL BE 10" FOR A 50' POLE, 9-1/2" FOR A 45' POLE, 9" FOR A 40' POLE, 8-1/2" FOR A 35' POLE AND 8" FOR A 30' POLE.

TYPE B POLE					
BRACKET SPREAD 6' OR 15'					
MAX. LUMINAIRE V	VE I GHT		60 LB		
MAX. PROJECTED A	MAX. PROJECTED AREA 3.3 SQ. FT.				
	SINGLE BRACKET ARM				
LOCATION	BRACKET SPREAD	AD D ANCHO			
BRIDGE SAFETY BARRIER CURB			1-1/4"		
	TRUSSED BRACKET ARI	VI			
LOCATION			ANCHOR BOLT DIA.		
BRIDGE SAFETY BARRIER CURB					

	ANS I	LAMPS	
FUSE RATING	DESIGNATION HPS	WATTS	INITIAL LUMENS
3.4	S55	150	16,000
5A	\$50	250	27,500
7 A	S51	400	50,000

TYPE III MEDIUM DISTRIBUTION SEMI-CUTOFF UNLESS OTHERWISE SPECIFIED ON PLANS

TYPE MB POLE					
BRACKET SPREAD		6′ (R 15'		
MAX. LUMINAIRE W	/E I GHT	60	LB		
MAX. PROJECTED A	REA	3.3	SQ. FT.		
1	DOUBLE BRACKET ARM				
LOCATION	BRACKET SPREAD D NOM				
MEDIAN BARRIER CURB	6′		10"		
DOUE	BLE TRUSSED BRACKE	T ARM			
LOCATION	BRACKET SPREAD D NOM.				
MEDIAN BARRIER CURB	URB 15' 10"				

GENERAL NOTES:

THE CORRECT MOUNTING HEIGHT WILL BE OBTAINED BY ADJUSTING DOWNWARD FROM THE 6" MINIMUM CLEARANCE BETWEEN THE POLE CAP AND THE TOP OF THE BRACKET ARM

HOLES SHALL BE PUNCHED ONLY FOR SPECIFIED BOLT CIRCLE.

TRANSFORMER BASE SHALL BE CERTIFIED AS MEETING THE BREAKAWAY CRITERIA AND STRUCTURAL REQUIREMENTS AS SET BY THE CURRENT ASSHTO. "STANDARD SPECIFICATIONS FOR STRUCURAL SUPPORTS FOR HIGHWAY SIGNS. LUMINARIES. AND TRAFFIC SIGNALS" AND MEET THE BREAKAWAY REQUIREMENTS OF NCHRP 350.

HANDHOLE SHALL BE APPROX. 4" X 6½". HANDHOLE FRAME SHALL BE REINFORCED SO THAT THE POLE STRENGTH

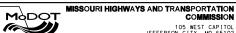
TRANSFORMER BASES FOR 45' MOUNTING HEIGHT SHALL BE FURNISHED WITH ONE DRILLED AND TAPPED HOLE AND GROUNDING LUG FOR GROUNDING EQUIPMENT.

ALL JUNCTION BOXES SHALL CONFORM TO SECTION 1062 OF THE STANDARD SPECIFICATIONS.

TYPE AT POLES SHALL BE EQUIPED WITH THE GROUNDING LUG INSIDE THE TRANSFORMER BASE. TYPE B AND MB POLES SHALL BE EQUIPED WITH A GROUNDING LUG INSIDE

POST SHALL BE GROUNDED FROM GROUND LUG IN POST WITH #6 AWG BARE COPPER WIRE TO CONDUIT SYSTEM. GROUND LUG SHALL BE 90° OR 180° FROM HANDHOLE.

THE CABLE ENTRANCE AT THE BRACKET ARM SHALL BE A FIELD DRILLED $1\frac{1}{4}^{\prime\prime}$ DIA. HOLE.



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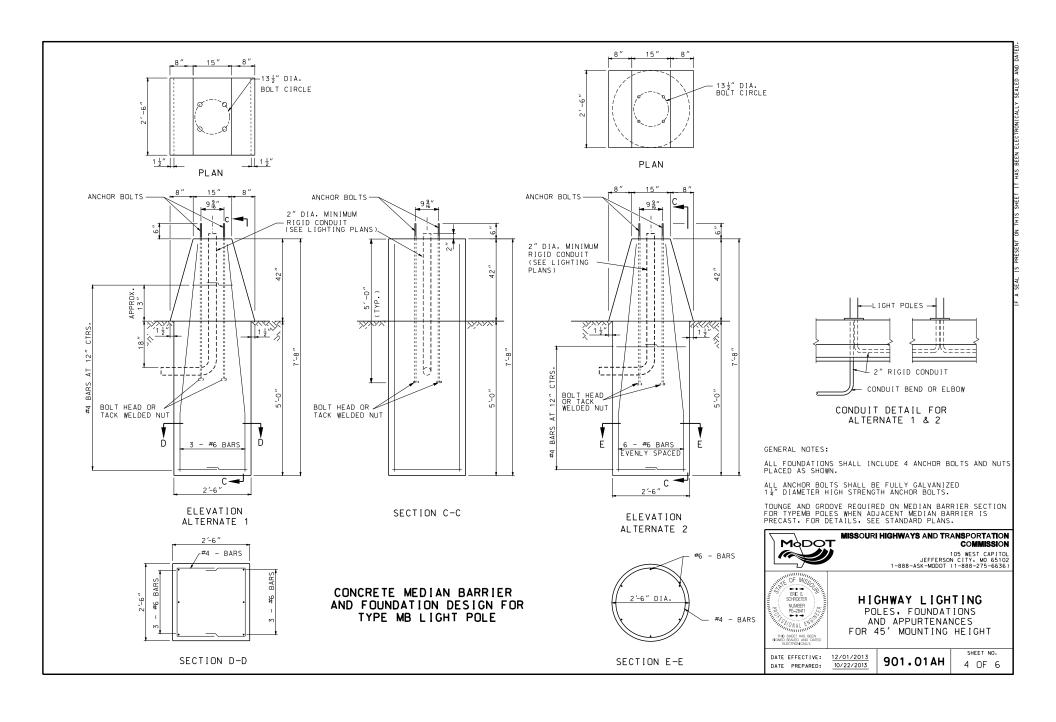
HIGHWAY LIGHTING POLES, FOUNDATIONS AND APPURTENANCES FOR 45' MOUNTING HEIGHT

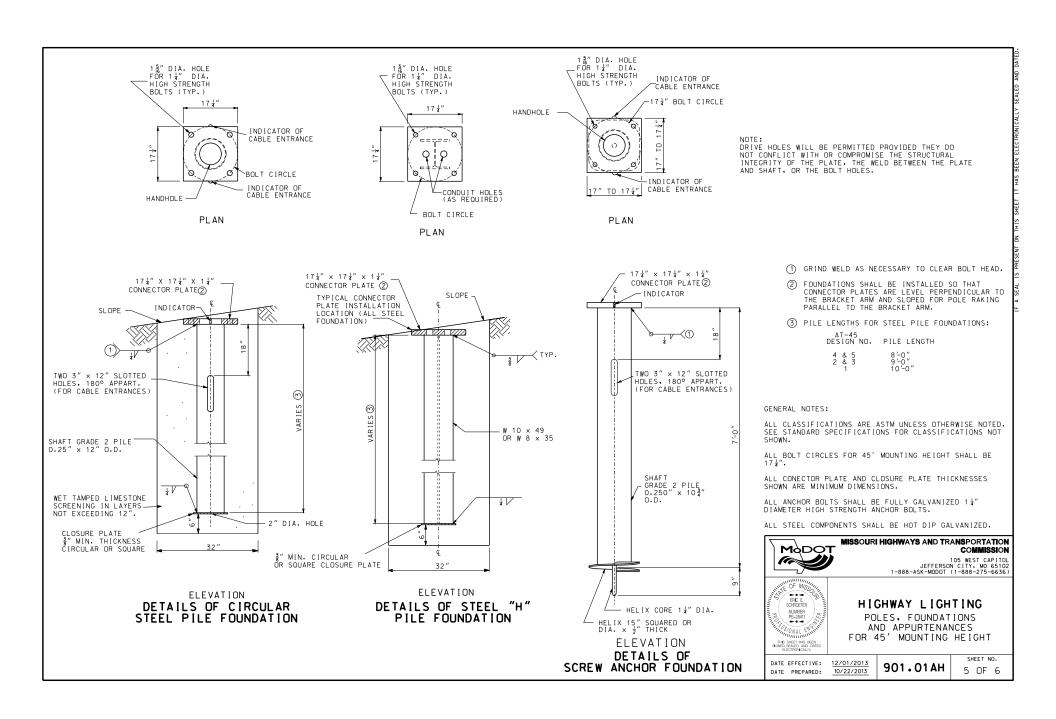
DATE EFFECTIVE: 12/01/2013 DATE PREPARED: 10/22/2013

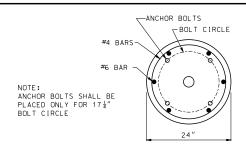
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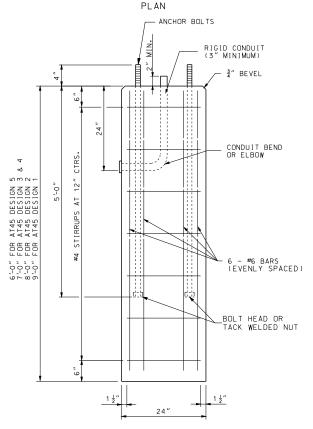
SHEET NO. 3 OF 6

COMMISSION



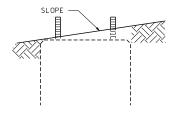






4 AT THE OPTION OF THE CONTRACTOR THE CONCRETE FOUNDATIONS MAY BE PRECAST. IF PRECAST, THEY SHALL BE SET IN DRILLED HOLES 3 FEET IN DIAMETER AND 6 INCHES DEEPER THAN THE BOTTOM OF THE CONCRETE FOUNDATION. THE BOTTOM 6 INCHES OF THE HOLE AND THE REMAINING SPACE AROUND THE FOUNDATION SHALL BE BACKFILLED WITH WET TAMPED LIMESTONE SCREENINGS IN LAYERS NOT EXCEEDING 12 INCHES.

a	UANTITIE	S
	CONC.	REINF.
HEIGHT	CU. YD.	LBS.
6'-0"	.70	80
7′-0″	.81	90
8′-0″	.93	104
9'-0"	1.05	120



CONCRETE FOUNDATION **EMBEDMENT**

ELEVATION

DETAILS OF CONCRETE FOUNDATION (4)

GENERAL NOTES:

ALL CLASSIFICATIONS ARE ASTM UNLESS OTHERWISE NOTED. SEE STANDARD SPECIFICATIONS FOR CLASSIFICATIONS NOT

ALL BOLT CIRCLES FOR 45' MOUNTING HEIGHT SHALL BE

ALL CONECTOR PLATE AND CLOSURE PLATE THICKNESSES SHOWN ARE MINIMUM DIMENSIONS.

ALL ANCHOR BOLTS SHALL BE FULLY GALVANIZED $1\frac{1}{4}^{\prime\prime}$ DIAMETER HIGH STRENGTH ANCHOR BOLTS.

ALL STEEL COMPONENTS SHALL BE HOT DIP GALVANIZED.

MISSOURI HIGHWAYS AND TRANSPORTATION MODOT COMMISSION

105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)



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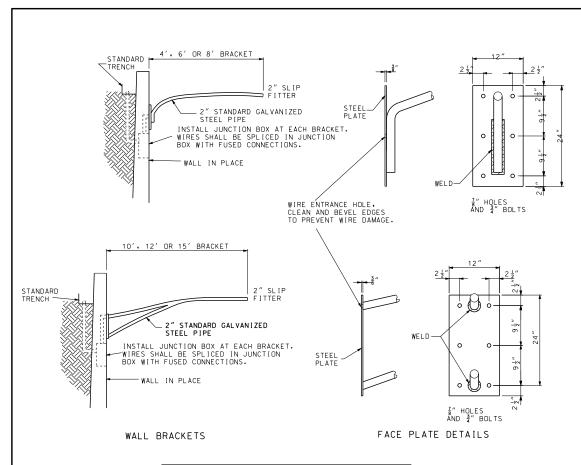
HIGHWAY LIGHTING POLES, FOUNDATIONS AND APPURTENANCES FOR 45' MOUNTING HEIGHT

DATE PREPARED:

DATE EFFECTIVE: 12/01/2013

901.01AH

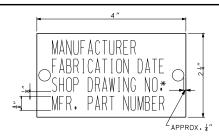
SHEET NO. 6 OF 6



	ANSI LAMPS			
FUSE RATING	DESIGNATION		INITIAL	
	HPS	WATTS	LUMENS	
3 A	S55	150	16,000	
TYPE III MEDIUM DISTRIBUTION SEMI-CUTOFF UNLESS OTHERWISE SPECIFIED ON PLANS				

TYPE AT POLE							
BRACKET	SPREAD			4'-10'	12′		15′
MAX. LU	MINAIRE	WEIGHT		75 LB	71 LE	3	66 LB
MAX. PROJECTED AREA 3.3 SQ. FT.					т.		
	SINGLE	AND TRUSSED E	BRA	CKET AR	MS		
LOCATION	LENGTH POLE	BRACKET SPREAD		TRANS. BASE BOLT CIRC.			D
SHOULDER	28′	4′.6′,8′. 10′.12°.15′	15"		8 "		

TYPE B POLE					
BRACKET SPRE	AD		4 ′	6′	8′
MAX. LUMINAI	IRE WEIGH	T	75 LB	75 LB	54 LB
MAX. PROJECT		3.3	3 SQ. F	т.	
	SING	LE BRACKET A	.RM		
LOCATION	LENGTH POLE	BRACKET SPREAD	D	ANCHOR BOL	
BRIDGE SAFETY BARRIER CURB	28′	4′•6′ 8′	8"		۱"



ID TAG NOTE: TAG SHALL BE ALUMINUM OR STAINLESS STEEL AND ATTACHED TO POLE USING TWO RIVETS OR STAINLESS STEEL DRIVE SCREWS.

* INCLUDING REVISION

IDENTIFICATION TAG

GENERAL NOTES:

HOLES SHALL BE PUNCHED ONLY FOR SPECIFIED BOLT CIRCLE.

TYPE AT POLES SHALL BE EQUIPPED WITH THE GROUNDING LUG INSIDE THE TRANSFORMER BASE. TYPE B POLES SHALL BE EQUIPPED WITH A GROUNDING LUG INSIDE THE POLE.

TRANSFORMER BASES FOR 30 FOOT MOUNTING HEIGHT SHALL BE FURNISHED WITH ONE (1) DRILLED AND TAPPED HOLE AND GROUNDING LUG FOR GROUNDING EQUIPMENT.

TRANSFORMER BASE SHALL BE CERTIFIED AS MEETING THE BREAKAWAY CRITERIA AND STRUCTURAL REQUIREMENTS AS SET BY THE CURRENT AASHTO "STANDARD SPECIFICATIONS FOR STRUCTURAL STEEL SUPPORTS FOR HIGHWAY SIGNS. LUMINARIES, AND TRAFFIC SIGNALS" AND MEET THE BREAK-AWAY REQUIREMENTS OF NCHRP 350.

ALIGN HANDHOLE SO THAT THE POLE IS BETWEEN THE ONCOMING TRAFFIC AND THE HANDHOLE. HANDHOLE SHALL BE APPROX. 4" X 6-1/2". HANDHOLE FRAME SHALL BE REINFORCED SO THAT THE POLE STRENGTH IS NOT REDUCED.

ALL JUNCTION BOXES SHALL CONFORM TO SECTION 1062 OF THE STANDARD SPECIFICATIONS.

IF CABLE-CONDUIT IS SPECIFIED. CUT CONDUIT AWAY FROM CABLES. CABLES SHALL BE CONTINUOUS AND UNSPLICED TO THE FIRST LIGHT POLE.

THE CABLE ENTRANCE AT THE BRACKET ARM SHALL BE A FIELD DRILLED 1-1/4" DIA. HOLE.

POST SHALL BE GROUNDED FROM GROUND LUG IN POST WITH #6 AWG BARE COPPER WIRE TO CONDUIT SYSTEM. GROUND LUG SHALL BE 90° OR 180° FROM THE HANDHOLE.

ID TAG HOLES SHALL BE DRILLED INTO POLE PRIOR TO GALVANIZING.



MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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HIGHWAY LIGHTING



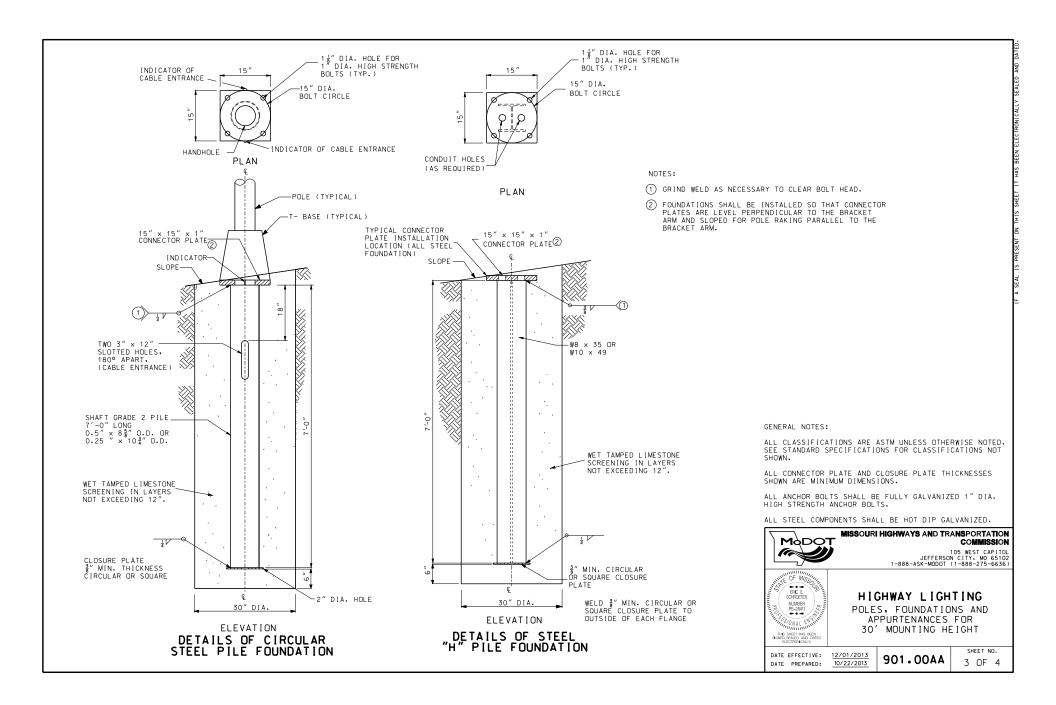
POLES, FOUNDATIONS AND APPURTENANCES FOR 30' MOUNTING HEIGHT

DATE PREPARED:

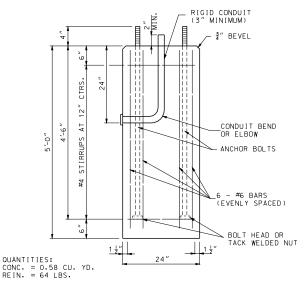
DATE EFFECTIVE: 12/01/2013

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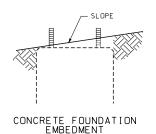
SHEET NO. 2 OF 4

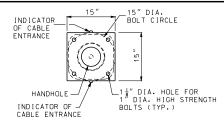


PLAN

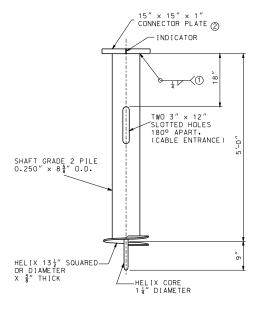


ELEVATION DETAILS OF CONCRETE FOUNDATION 3



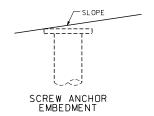


PLAN



ELEVATION

DETAILS OF SCREW ANCHOR FOUNDATION



DRIVE HOLES WILL BE PERMITTED PROVIDED THAT THEY DO NOT CONFLICT WITH OR COMPROMISE THE STRUCTURAL INTEGRITY OF THE PLATE, THE WELD BETWEEN THE PLATE AND SHAFT, OR THE BOLT HOLES.

NOTES:

- (1) GRIND WELD AS NECESSARY TO CLEAR BOLT HEAD.
- 2) FOUNDATIONS SHALL BE INSTALLED SO THAT CONNECTOR PLATES ARE LEVEL PERPENDICULAR TO THE BRACKET ARM AND SLOPED FOR POLE RAKING PARALLEL TO THE BRACKET ARM.
- (3) AT THE OPTION OF THE CONTRACTOR THE CONCRETE FOUNDATION MAY BE PRECAST. IF PRECAST, THEY SHALL BE SET IN DRILLED HOLES 3 FEET IN DIAMETER AND 6 INCHES DEEPER THAN THE BOTTOM OF THE CONCRETE FOUNDATION. THE BOTTOM 6 INCHES OF THE HOLE AND THE REMAINING SPACE AROUND THE FOUNDATION SHALL BE BACKFILLED WITH WET TAMPED LIMESTONE SCREENINGS IN LAYERS NOT EXCEEDING

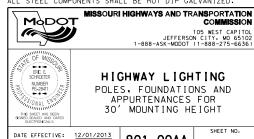
GENERAL NOTES:

ALL CLASSIFICATIONS ARE ASTM UNLESS OTHERWISE NOTED. SEE STANDARD SPECIFICATIONS FOR CLASSIFICATIONS NOT

ALL CONNECTOR PLATE AND CLOSURE PLATE THICKNESSES SHOWN ARE MINIMUM DIMENSIONS.

ALL ANCHOR BOLTS SHALL BE FULLY GALVANIZED 1" DIA. HIGH STRENGTH ANCHOR BOLTS.

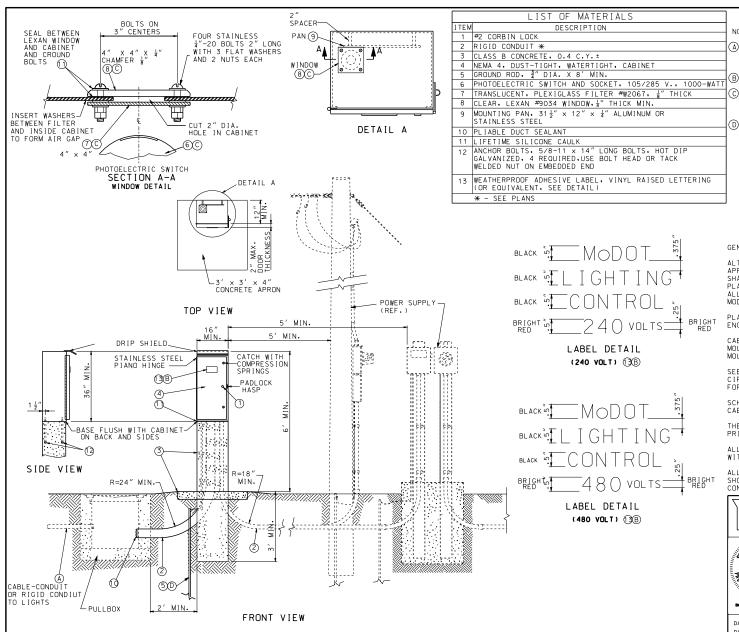
ALL STEEL COMPONENTS SHALL BE HOT DIP GALVANIZED.



DATE PREPARED:

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4 OF 4



NOTES

- IF CABLE-CONDUIT IS SPECIFIED, THE CONDUIT SHALL BE CUT AWAY FROM CABINET BETWEEN PULL BOX AND CONTROL STATION.
- LIGHTING SYSTEM VOLTAGE AS SPECIFIED ON PLANS.
- PHOTOELECTRIC SWITCH BRACKETS MAY VARY, LOCATE CENTER OF WIDOW OVER CENTER OF PHOTOELECTRIC
- IF SUBSURFACE CONDITIONS EXIST WHICH PROHIBIT THE PLACEMENT OF THE GROUND ROD IN A VERTICAL POSITION. THE ROD MAY BE DRIVEN AT AN OBLIQUE ANGLE NOT TO EXCEED 45 DEGREES FROM VERTICAL OR BURIED IN A TRENCH AT LEAST 30 IN. DEEP. CON-NECTION TO GROUND ROD SHALL BE CADWELDED.

GENERAL NOTES:

ALTERNATE CABINET DIMENSIONS WILL BE ALLOWED AS APPROVED BY THE ENGINEER. INTERIOR CABINET VOLUME SHALL BE EQUAL TO OR GREATER THAN THAT SHOWN ON PLANS AND PROPER CLEARANCES SHALL BE PROVIDED FOR ALL EQUIPMENT. CONCRETE BASE DIMENSIONS SHALL BE MODIFIED TO FIT THE CABINET SUPPLIER.

PLACEMENT OF ALL ITEMS SHALL BE APPROVED BY THE ENGINEER.

CABINET SHALL BE LOCATED AWAY FROM TRAFFIC. TOP MOUNT PHOTO CONTROL SHALL FACE AN OPEN SKY. SIDE MOUNT PHOTO CONTROL SHALL FACE NORTH.

SEE PLANS FOR CIRCUIT WIRING: MAXIMUM LOADING PER CIRCUIT IS 7,400 WATTS FOR 240 VOLT AND 11,000 WATTS FOR 480 VOLT.

SCHEMATIC DIAGRAM SHALL BE MOUNTED ON INSIDE OF CABINET DOOR.

THE UTILITY SHALL BE NOTIFIED IN WRITING 30 DAYS PRIOR TO DATE SERVICE WILL BE REQUIRED.

ALL OPENINGS IN CABINET SHALL BE COVERED AND SEALED WITH LIFETIME SILICONE CAULK.

ALL MATERIALS REQUIRED EXCLUDING REFERENCE ITEMS AS SHOWN ON DRAWING SHALL BE INCLUDED IN PRICE BID FOR CONTROL STATION.



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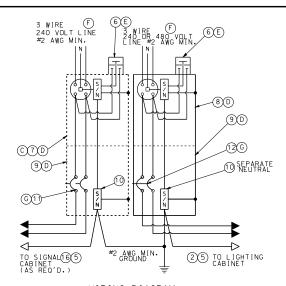
HIGHWAY LIGHTING BASE MOUNTED CONTROL STATION 240 V OR 480 V - 4 CIRCUIT

DATE EFFECTIVE: 04/01/2005 DATE PREPARED:

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SHEET NO. 1 OF 2

	LIST OF MATERIALS
ITEM	DESCRIPTION
1	SERVICE POLE 30' MIN., CLASS 4 WOOD, CONTRACTOR PROVIDED, MODOT OWNED*
2	#2 AWG MIN. CABLE, 600 VOLT *
3	SERVICE ENTRANCE HEAD
4	GUY CABLE, AS REQUIRED
5	RIGID CONDUIT, 2" MIN., WITH PREFORMED ELBOWS
6	LIGHTNING ARRESTER, VALVE TYPE, 2 POLE, 650 VOLT
7	METER SOCKET, 200 AMP, FOR SIGNALS
8	METER SOCKET, 200 AMP, FOR LIGHTING
9	LOCKING. RAINTIGHT. NEMA 4 SERVICE DISCONNECT BOX
10	INSULATED, GROUNDABLE NEUTRAL WIRE, 200 AMP MINIMUM
11	SIGNAL BREAKERS, SINGLE POLE, 40A MIN, TYPE A OR B *
12	LIGHTING BREAKER, 2 POLE, 240 VOLT, 100A, TYPE A OR B
13	1/2" METAL CONDUIT
14	#2 AWG MIN, GROUND WIRE
15	GROUND ROD. 3/4" x 8' MIN.
16	#8 AWG MIN, CABLE, 600 VOLT *
17	CLASS B CONCRETE, 0.92 C.Y.±
18	THREADED CONDUIT HUB WITH SEALING WASHERS
19	WEATHERPROOF ADHESIVE LABEL (LIGHTING), VINYL RAISED LETTERING
	(OR EQUIVALENT, SEE DETAIL)
20	WEATHERPROOF ADHESIVE LABEL (SIGNALS), VINYL RAISED LETTERING
	(OR EQUIVALENT, SEE DETAIL)
21	W6 x 9 OR W6 x 15 GALVANIZED POST
22	#2 AWG MIN. CABLE, 600 VOLT
23	RIGID CONDUIT, 2" MINIMUM
*	SEE PLANS

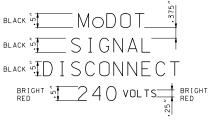


WIRING DIAGRAM
LIGHTING AND/OR SIGNALS





LABEL DETAIL 19 (480 F)



LABEL DETAIL

NOTES:

- (A) SERVICE POLE SHALL BE GUYED WHEN SPAN OF OVERHEAD SERVICE WIRE EXCEEDS 50 FEET.
- (B) INCREASE 1 FOOT FOR EACH 5 FEET ABOVE 30 FEET.
- © SERVICE DISCONNECT BOXES AND METER BOXES SHALL BE ALUMINUM OR STAINLESS STEEL. ALL HARDWARE, HINGES, CATCHES, ETC. SHALL BE STAINLESS STEEL.METER SOCKET FOR SIGNALS OR LIGHTING AND OTHER EQUIPMENT AND MATERIALS SHALL BE U.L. APPROVED, AND CONFORM TO THE REQUIREMENTS OF THE UTILITY COMPANY OR MUNICIPALITY PROVIDING POWER.
- (D) SCHEMATIC DIAGRAM SHALL BE MOUNTED ON INSIDE OF CABINET DOOR.
- E UTILITY COMPANY SHALL DECIDE IF LIGHTNING ARRESTERS ARE TO BE CONNECTED ON THE LOAD OR LINE SIDE OF THE METER. THE UTILITY COMPANY SHALL ALSO DECIDE IF THE LIGHTNING ARRESTER IS TERMINATED IN THE METER OR DISCONNECT CABINET. IF TERMINATED IN THE DISCONNECT CABINET. IT SHALL BE INSTALLED ON THE DISCONNECT CABINET.
- (F) LIGHTING SYSTEM VOLTAGE OF 240 VOLTS OR 480 VOLTS AS SHOWN ON THE PLANS.
- © BREAKERS SHALL CONFORM TO SEC. 901.4 OF THE STANDARD SPECIFICATIONS.
- H) IF SUBSURFACE CONDITIONS EXIST WHICH PROHIBIT THE PLACEMENT OF THE GROUND ROD IN A VERTICAL POSITION. THE ROD MAY BE DRIVEN AT AN OBLIQUE ANGLE NOT TO EXCEED 45 DEGREES FROM VERTICAL OR BURIED IN A TRENCH AT LEAST 30 IN. DEEP. CONNECTION TO GROUND ROD SHALL BE CADWELDED.

GENERAL NOTES:

FOR CABLE TYPES AND INSTALLATION, SEE STANDARD SPECIFICATIONS.

THE POWER SUPPLY ASSEMBLY TYPE IS SHOWN ON THE PLANS OR IS DESIGNATED IN THE CONTRACT.

THE UTILITY COMPANY SHALL BE NOTIFIED IN WRITING 30 DAYS PRIOR TO DATE SERVICE WILL BE REQUIRED.

WHERE SIGNAL OR LIGHTING POWER ONLY IS DESIGNATED, OMIT ITEMS NOT REQUIRED.

ALL OPENINGS IN ANY SERVICE BOX OR METER BOX SHALL BE COVERED AND SEALED WITH LIFETIME SILICONE CAULK.

ALL MATERIALS REQUIRED AS SHOWN ON DRAWING, INCLUDING CABLE AND CONDUIT FROM POWER SUPPLY ASSEMBLY TO UTILITY COMPANY FACILITIES, SHALL BE INCLUDED IN UNIT BID PRICE FOR POWER SUPPLY ASSEMBLY.



MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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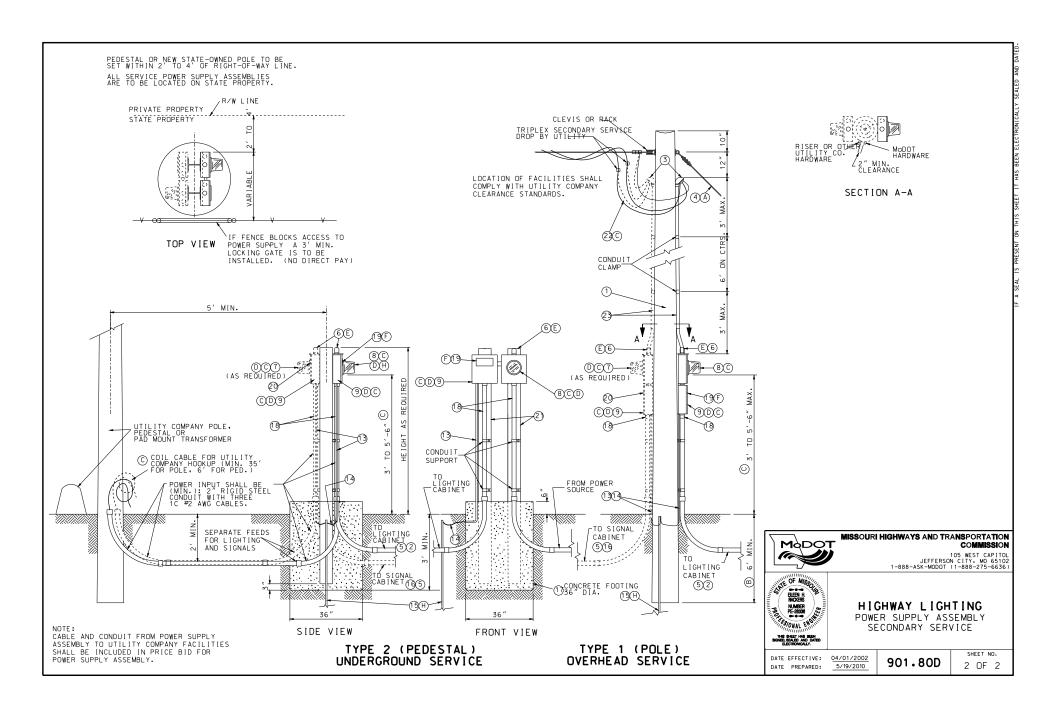
HIGHWAY LIGHTING POWER SUPPLY ASSEMBLY SECONDARY SERVICE

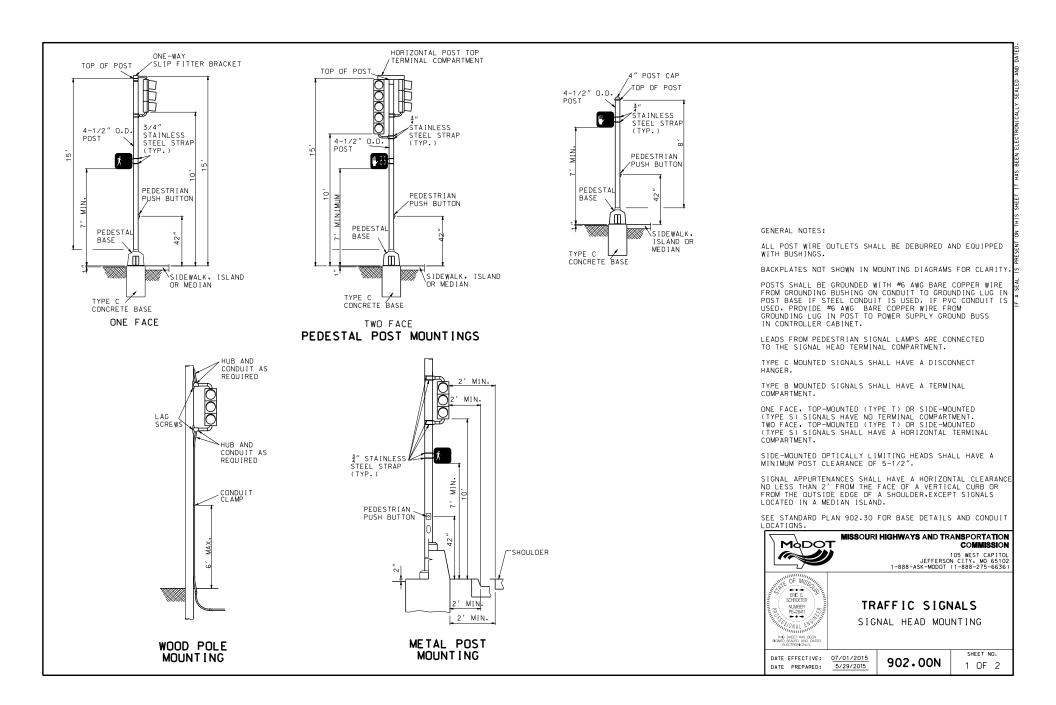
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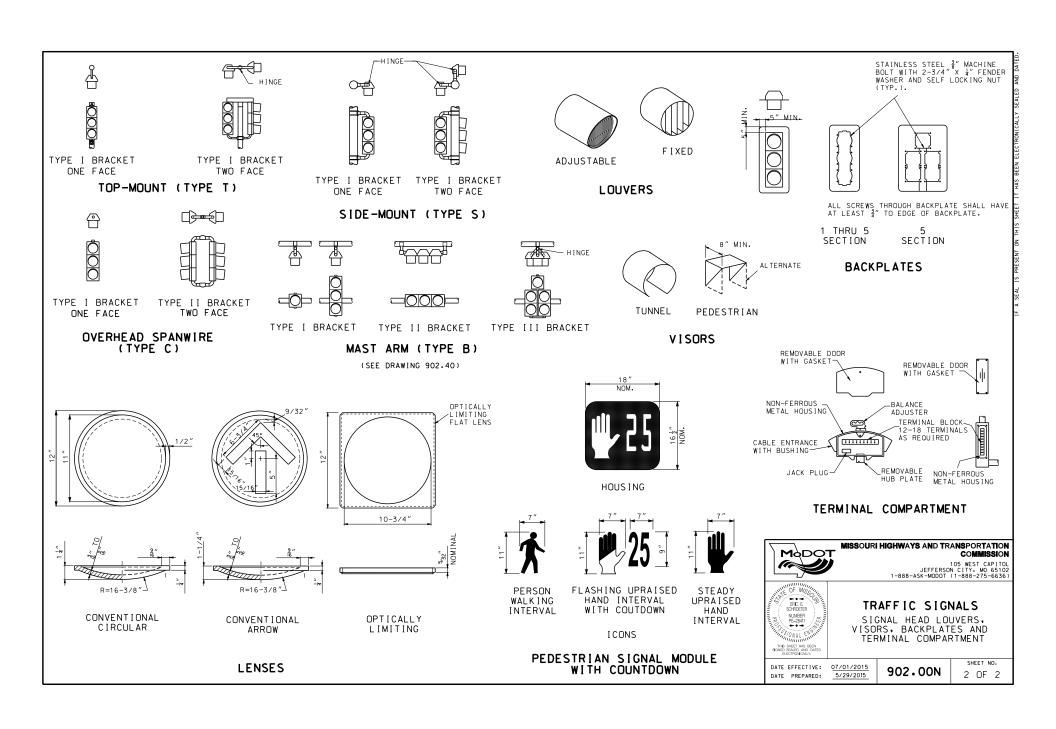
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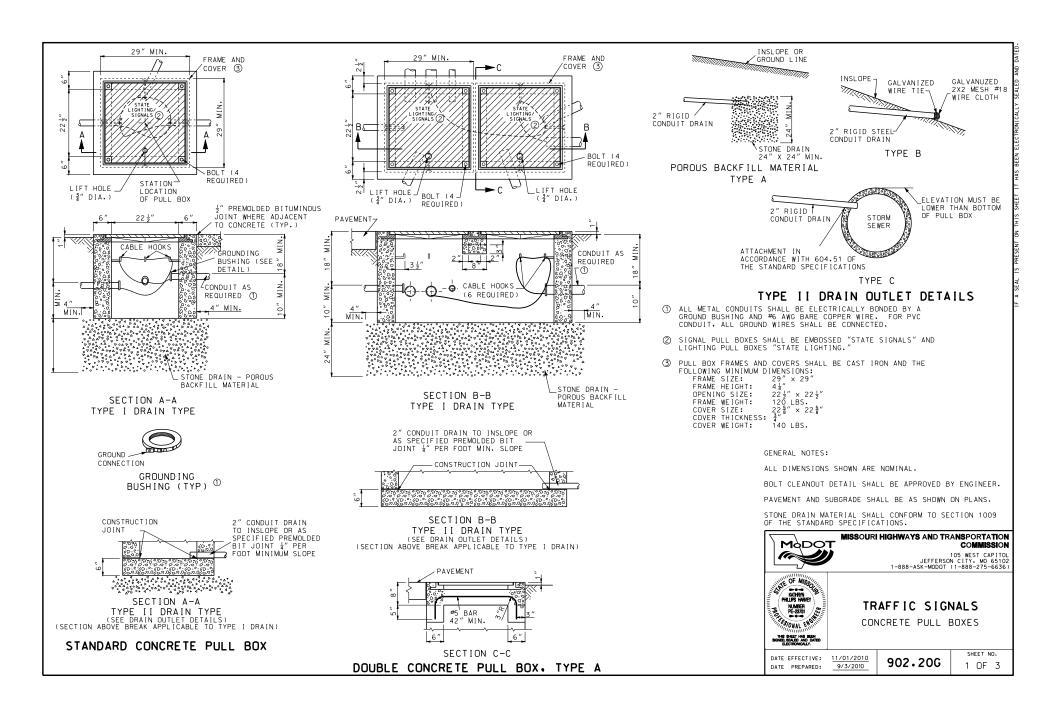
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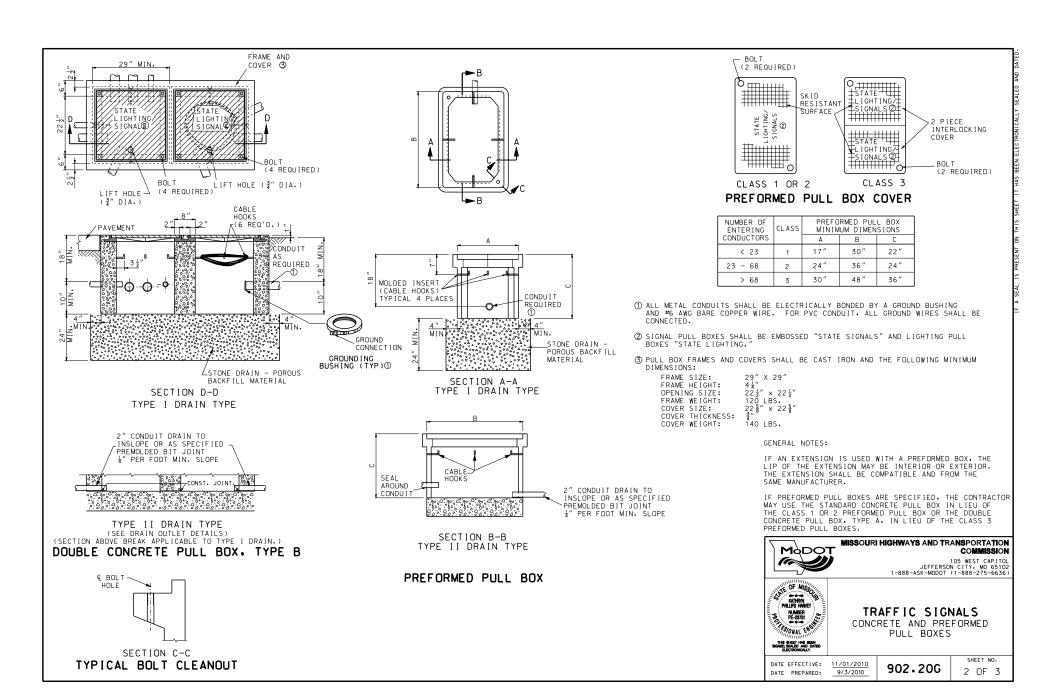
SHEET NO.

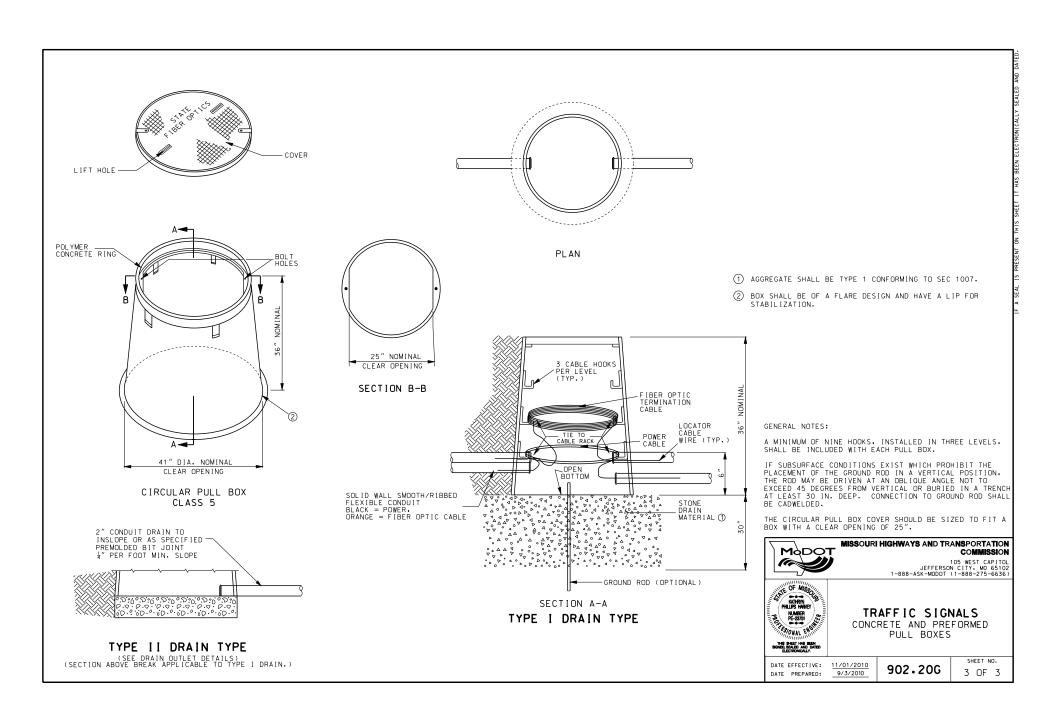


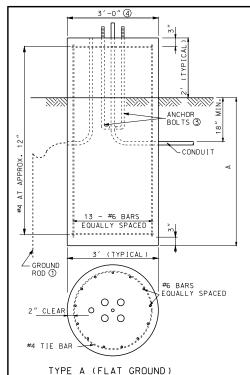






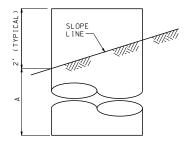






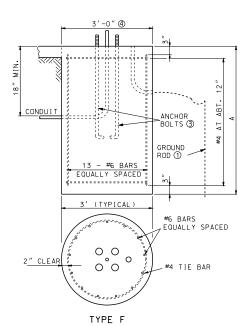
TYPICAL -SLOPE LINE

TYPE A (FILL) (FOR ADDITIONAL DETAILS SEE TYPE A FLAT GROUND)



TYPE A (CUT) (FOR ADDITIONAL DETAILS SEE TYPE A FLAT GROUND)

POST BASES



TYPE C

FOR A DEPTH OF 12".

2′

APPLICABLE ONLY WHERE CONTROLLER IS MOUNTED TO A SIGNAL POLE.

st SURFACE OF BASE TO BE CONSTRUCTED SQUARE

ANCHOR

BOLTS 3

CONDUIT

- BASE PLATE SHALL STAY WITHIN THE TOP OF THE POST BASE DIAMETER.
- ANCHOR BOLT DIMENSIONS ARE SHOWN ON THE MANUFACTURER'S APPROVED DRAWINGS.
- MAXIMUM BOLT CIRCLE DIAMETER IS 26". BASE PLATE SHALL STAY WITHIN THE TOP OF THE POST BASE DIAMETER.
- 5 ARM LENGTH DETERMINED BY LENGTH OF LONGEST ARM FOR TYPE B & BL SIGNAL POSTS.
- 6 BASE TYPE A OR F DETERMINED BY LOCATION OF POST BASE.
- 7 SOIL DEPTH, NO ROCK.
- INCLUDE #4 TIE BAR.
- WHEN CONCRETE BASE IS LOCATED WITHIN 8" CONCRETE DIVISIONAL ISLAND. EMBEDMENT LENGTH MAY BE REDUCED BY ½ DIAMETER OF THE DRILLED SHAFT.

	BASE	EMBEDMENT	IN S	SOLID ROCK
SOLID ROCK ENCOUNTER POINT			REQUIRED EMBEDMENT FOR BASE TYPE	
				A-10 F-10
AT SURF	ACE			4′-9″
AT ONE-	-FOURTH	I NORMAL DEPTH		4′-0″
AT ONE-	HALF N	IORMAL DEPTH		3′-3″
AT THRE	E-FOUF	THS NORMAL DE	PTH	1′-3″

- 1. REQUIRED EMBEDMENT DEPTHS CAN BE INTERPOLATED BETWEEN ENCOUNTER POINTS FOR OTHER SOLID ROCK ENCOUNTER DEPTHS.
- NORMAL LENGTHS FOR ANCHOR BOLTS AND REINFORCING STEEL WILL BE REQUIRED.
- CORE DRILL HOLES FOR ANCHOR BOLTS AND REINFORCING STEEL IN SOLID ROCK SHALL BE PROVIDED. CORE DRILL HOLES SHALL BE TWICE THE DIAMETER OF THE ANCHOR BOLT AND REINFORCING STEEL DIAMETER AND TO WITHIN 3 INCHES OF THE NORMAL BASE DEPTH.
- IF SOIL, SHALE, GRAVEL, FRACTURED ROCK, OR VOIDS ARE ENCOUNTERED DURING CORE DRILLING. THE ROCK SHALL BE REMOVED TO THE POINT OF ENCOUNTER.
- ANCHOR BOLTS AND REINFORCING STEEL SHALL BE GROUTED IN THE CORE DRILL HOLES WITH NON-SHRINK GROUT HAVING A MINIMUM STRENGTH OF 9.000 POUNDS IN 24 HOURS.
- STRAIGHT ANCHOR BOLTS OF THE LENGTH SHOWN IN THE ANCHOR BOLT TABLE UNDER THE COLUMN "BOLT LENGTH" ARE ADEQUATE FOR USE IN GROUTED CORE DRILLED

POST BASES						
POST TYPE	ARM LENGTH (FEET) ⑤	BASE TYPE 6				
C OR CL	15 - 25	A-9 OR F-9				
C OR CL	30 - 35	A-9.5 OR F-9.5				
C OR CL	40 - 55	A-10.5 OR F-10.5				
B OR BL	15 - 25	A-10 OR F-10				
B OR BL	30 - 35	A-11 OR F-11				
B OR BL	40 - 55	A-12 OR F-12				

REQU	STEEL AND CONCRETE REQUIREMENTS FOR POST BASES®					
	BASES	#6 STE	EL BAR	CONC.		
TYPE	A 🗇	LENGTH	WEIGHT LBS.	C.Y.		
A-9	9'-0"	10'-6"	270	2.88		
A-9.5	9'-6"	11'-0"	280	3.01		
A-10	10'-0"	11'-6"	300	3.14		
A-10.5	10'-6"	12'-0"	310	3.27		
A-11	11'-0"	12'-6"	320	3.40		
A-12	12'-0"	13'-6"	350	3.67		
F-9	9'-0"	8'-6"	230	2.36		
F-9.5	9′-6″	9'-0"	240	2.49		
F-10	10'-0"	9'-0"	240	2.62		
F-10.5	10'-6"	10'-0"	260	2.75		
F – 1 1	11'-0"	10'-6"	270	2.88		
F-12	12'-0"	11'-6"	300	3.14		
C *				0.44		

* SURFACE OF BASE TO BE CONSTRUCTED SQUARE FOR A DEPTH OF 12".

MISSOURI HIGHWAYS AND TRANSPORTATION MODOT COMMISSION

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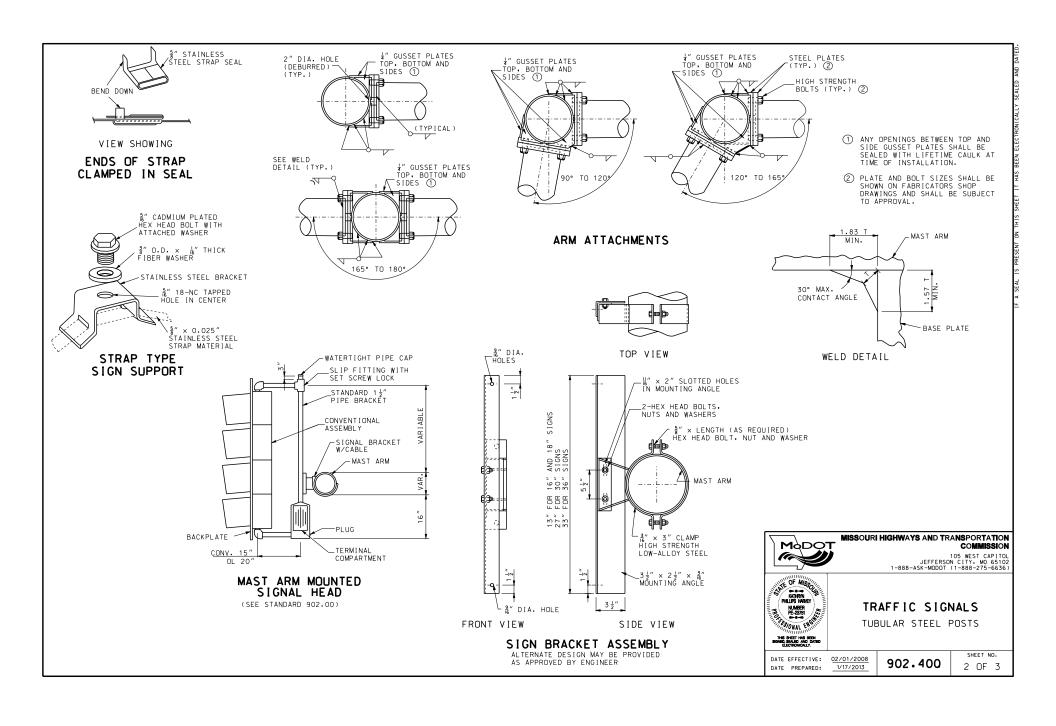
TRAFFIC SIGNALS

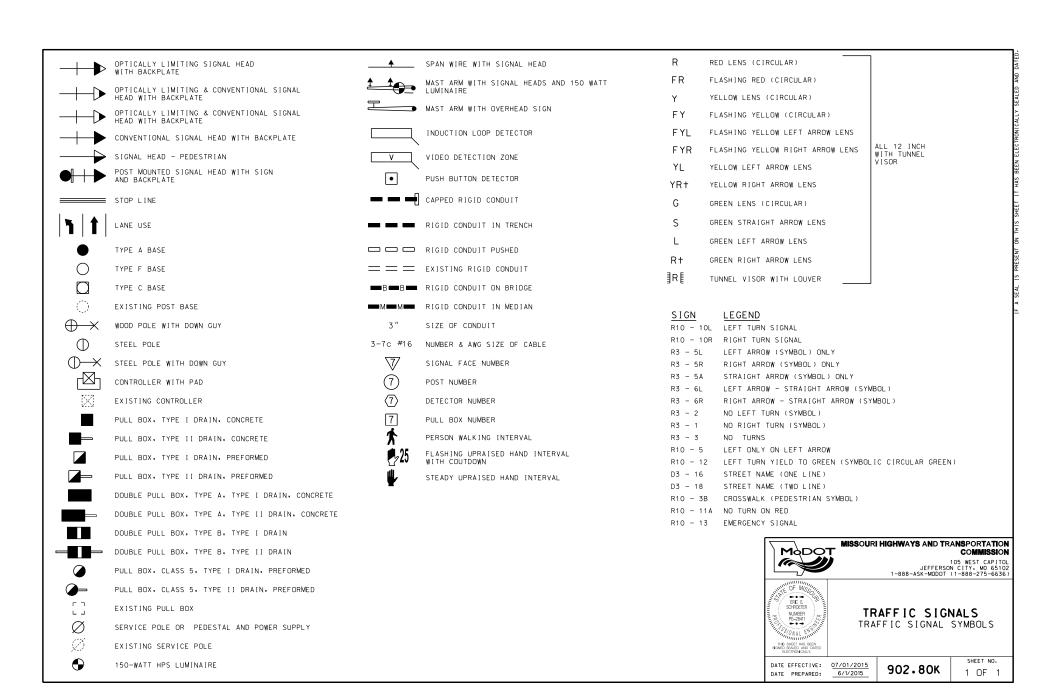
POST BASES

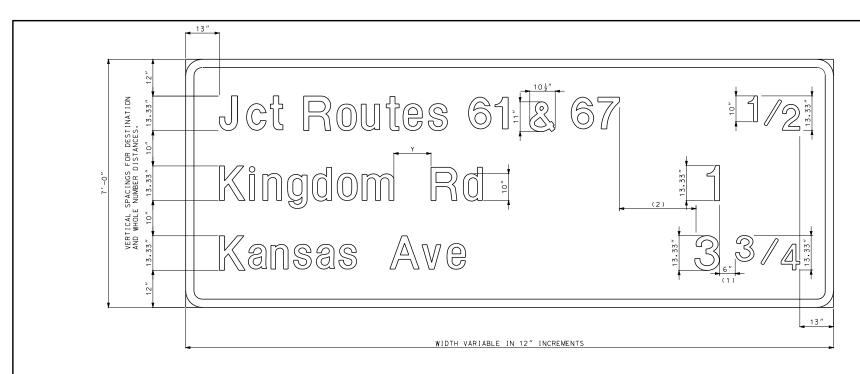
DATE EFFECTIVE: 02/01/2008 DATE PREPARED: 7/19/2012

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SHEET NO. 1 OF 2







LEGEND, SYMBOLS & BORDER

L-3 DIRECT APPLIED (CUT FROM MATERIAL SHOWN ON PLANS.)

BACKGROUND REFLECTIVE SHEETING

R2 REFER TO MISSOURI SPECIFICATION SECTION 1042.2.7.2
R4 REFER TO MISSOURI SPECIFICATION SECTION 1042.2.7.3

(1) 6" STANDARD, HORIZONTALLY ALIGN RIGHT EXTREME EDGE OF WHOLE NUMERALS, REGARDLESS OF LINE OF COPY.

HORIZONTALLY ALIGN RIGHT EXTREME EDGE OF FRACTIONS REGARDLESS OF LINE COPY.

WHEN NO FRACTIONS EXIST, RIGHT EXTREME EDGE OF WHOLE NUMERALS SHALL BE 13" FROM EDGE OF SIGN.

(2) UPPER CASE LETTER HEIGHT FROM LONGEST DESTINATION TO LONGEST DISTANCE.

INCREASE THIS SPACE TO PROVIDE EVEN 12" WIDTH FOR ENTIRE SIGN.

NOTES:

"ROUTE" SHALL NOT BE ABBREVIATED.

INTERSTATES SHALL BE REFERENCED WITH A CAPITAL "I". (EX. ROUTE I-29).

Y = UPPER CASE LETTER HEIGHT.

USE HYPHEN TO JOIN 2 ROUTES SHARING THE SAME ROADWAY.

USE AN AMPERSAND TO SEPERATE 2 ROUTES ON INDIVIDUAL ROADWAYS.

USE COMMAS AND AN AMPERSAND TO SEPERATE 3 OR MORE ROUTES ON INDIVIDUAL ROADWAYS.

BORDER (ALL SIGNS)				
CORNER RADII	WIDTH			
SIGN HEIGHT	INCHES	LETTER SIZE	INCHES	
LESS THAN OR EQUAL TO 6'	6	LESS THAN 12"	1	
7′	9			
GREATER THAN OR EQUAL TO 8'	12	12" OR LARGER	2	

1	GENERAL SIGN DATA						
	STR2L-3	TYPE	REFLECTIVE SHEETING TYPE	COLOR	LETTER SERIES		
	BACKGROUND		R2	GREEN			
1	LEGEND	L-3	R4	WHITE	E(M)		
1	SYMBOLS	L-3	R4	VAR.			
1	BORDER	L-3	R4	WHITE			
J	SUBSTRATE	STRUCT	URAL				

GENERAL NOTES (ALL SIGNS):

GROUND MOUNTED SIGNS GREATER THAN 6 FEET WIDE OR SIGNS GREATER THAN 30 SQUARE FEET SHALL BE

GUIDE SIGN WIDTH VARIABLE IN 12" INCREMENTS.

GUIDE SIGN HEIGHT VARIABLE IN 12" INCREMENTS.

STATE ABBREVIATIONS SHALL BE THE STANDARD 2-LETTER POSTAL ABBREVIATION, AND SHALL BE DETAILED IN ALL-CAPS.

SEE OTHER STANDARD DRAWINGS FOR ARROW DETAILS.

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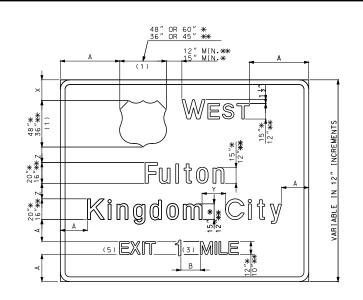
HIGHWAY SIGNING STRUCTURAL SIGNS

INTERCHANGE SEQUENCE

DATE EFFECTIVE: 02/01/2011 DATE PREPARED:

903.02AL

SHEET NO. 1 OF 19



TYPICAL ADVANCE GUIDE

48" OR 60"* (1) 36" OR 45"** INCREMENT 12" MIN.** |<u>1</u>5" MIN.* 36, 20, TYPICAL EXIT DIRECTION

Kingdom City 24.13" (4)

CROSSROAD GUIDE

GUIDE SIGN LEGEND

- = VARIABLE SO THAT THE OVERALL SIGN WIDTH IS IN 12" INCREMENTS MINIMUM LOWER CASE HEIGHT.
- = 1.5 TIMES WORDING LETTER HEIGHT.
- = APPROXIMATELY THE UPPERCASE LETTER HEIGHT. VARY THIS DIMENSION FOR HEIGHT AND WIDTH INCREMENTAL ROUNDING.
- = UPPER CASE LETTER HEIGHT
- = LOWER CASE LETTER HEIGHT
- = GROUND MOUNT
- = OVERHEAD

NOTES:

NUMERAL TO FRACTION SPACE, 8" GROUND MOUNT, 6" OVERHEAD.

HORIZONTALLY CENTER ALL LINES OF TEXT AND SYMBOLS.

BOX DIMENSION FRACTIONS: OVERHEAD IS 15" H x 20"W FOR 1/2, 1/4, 15"H x 25"W FOR 3/4, GROUND MOUNT 18"H x 24"W FOR 1/2, 1/4, 18"H x 30"W FOR 3/4.



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HIGHWAY SIGNING STRUCTURAL SIGNS

INTERCHANGE SEQUENCE

DATE EFFECTIVE: 02/01/2012 DATE PREPARED: 12/22/2011

903.02AL

SHEET NO. 2 OF 19

NOTES:

CARDINAL DIRECTION PLACED ON EXIT SIDE OF SHIELD.

- (1) ALTERNATE ROUTE SHIELDS MAY BE USED AS REQUIRED.
- (2) TYPE A ARROW AT 45° STANDARD REGARDLESS OF ROADWAY GEOMETRICS.
- (3) WHOLE NUMERALS, 18" GROUND MOUNT, 15" OVERHEAD.
- (4) LENGTH OF ARROW IS EQUAL TO 50% OF LEGEND LENGTH WITH MAXIMUM OF 48" IN 12" INCREMENTS.
- (5) IF EXIT NUMBER PANELS ARE USED WITH THE ADVANCE GUIDE SIGN, "EXIT" WILL NOT BE REQUIRED.

LEGEND, SYMBOLS & BORDER

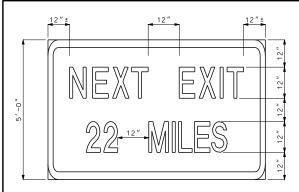
L-3 DIRECT APPLIED (CUT FROM MATERIAL SHOWN ON PLANS.)

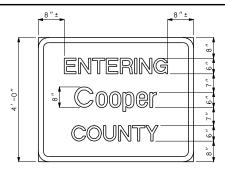
BACKGROUND REFLECTIVE SHEETING

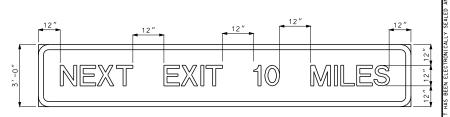
REFER TO MISSOURI SPECIFICATION SECTION 1042.2.7.2
REFER TO MISSOURI SPECIFICATION SECTION 1042.2.7.3

BORDER (ALL SIGNS)				
CORNER RADII	WIDTH			
SIGN HEIGHT	INCHES	LETTER SIZE	INCHES	
LESS THAN OR EQUAL TO 6'	6	LESS THAN 12"	1	
7′	9			
GREATER THAN OR EQUAL TO 8'	12	12" OR LARGER	2	

GENERAL SIGN DATA							
	STR2L-3 TYPE GROUND OVERHEAD COLOR SERIES						
STR2L-3	TYPE	TYPE GROUND OVERHEAD COLOR					
BACKGROUND	L-3	R2	R2	GREEN			
LEGEND	L-3	R4	R4	WHITE	E(M)		
SYMBOLS	L-3	R4	R4	VAR.			
BORDER L-3 R4 R4 WHITE							
SUBSTRATE STRUCTURAL (SEE GEN. NOTES ON SH.							







E2-1 NEXT EXIT SUPPLEMENTAL ADVANCE GUIDE

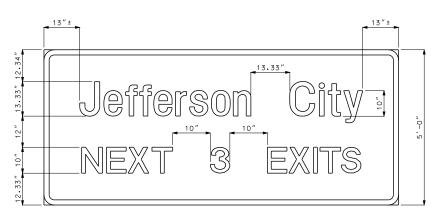
E2-1A

COUNTY LINE





(THREE LINES)



NEXT (X) EXITS

	BORDER (ALL SIGNS)			
	CORNER RADII		WIDTH	
	SIGN HEIGHT	INCHES	LETTER SIZE	INCHES
[LESS THAN OR EQUAL TO 6'	6	LESS THAN 12"	1
[7′	9		
	GREATER THAN OR EQUAL TO 8'	12	12" OR LARGER	2

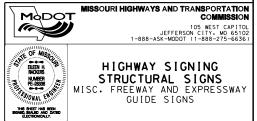
LEGEND, SYMBOLS & BORDER

L-3 DIRECT APPLIED (CUT FROM MATERIAL SHOWN ON PLANS.)

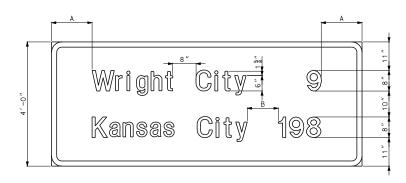
	GENERAL SIGN DATA						
STR2L-3	TYPE	REFLECT SHEETING		COLOR		RI	
BACKGROUND		R2		GREEN			
LEGEND	L-3	R4		WHITE	E	(M)	
SYMBOLS	L-3	R4		VAR.			
BORDER	L-3	R4		WHITE			
SUBSTRATE	STRUCT	URAL (SEE	GEN.	NOTES	ON S	н.	1)

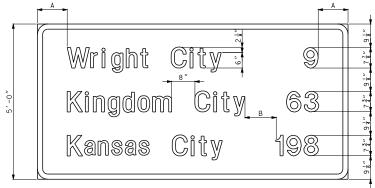
BACKGROUND REFLECTIVE SHEETING

R2 REFER TO MISSOURI SPECIFICATION SECTION 1042.2.7.2 R4 REFER TO MISSOURI SPECIFICATION SECTION 1042.2.7.3



DATE EFFECTIVE: 02/01/2012 DATE PREPARED: 12/22/2011 903.02AL 3 DF 19





NOTE: FOR INTERSTATE, LAST LINE OF COPY SHALL INDICATE APPROVED AASHTO CONTROL CITY.

POST INTERCHANGE/INTERSECTION DISTANCE

- A = VARIABLE SO THAT THE OVERALL SIGN WIDTH IS IN 12" INCREMENTS. MINIMUM LOWER CASE HEIGHT.
- = UPPER CASE LETTER HEIGHT. FROM LONGEST DESTINATION TO LONGEST DISTANCE, REGARDLESS OF LINE COPY.



12 12" OR LARGER

BACKGROUND REFLECTIVE SHEETING

R2 REFER TO MISSOURI SPECIFICATION SECTION 1042.2.7.2
R4 REFER TO MISSOURI SPECIFICATION SECTION 1042.2.7.3

LEGEND. SYMBOLS & BORDER

L-3 DIRECT APPLIED (CUT FROM MATERIAL SHOWN ON PLANS.)

STR2L-3 BACKGROUND

SUBSTRATE

EGEND

SYMBOLS

BORDER

GENERAL SIGN DATA

R2

R4

R4

R4

REFLECTIVE SHEETING TYPE COLOR

STRUCTURAL (SEE GEN. NOTES ON SH. 1)

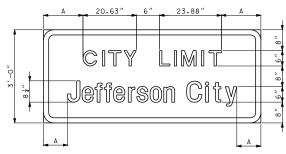
GREEN

WHITE

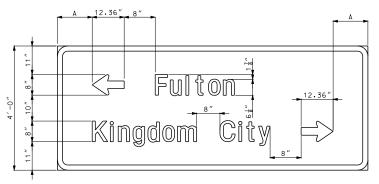
WHITE

VΔR.

E(M)



CITY LIMITS



NOTE: DESTINATIONS ARE PLACED IN THE FOLLOWING ORDER: AHEAD, LEFT, RIGHT. TYPE D ARROWS SHALL BE USED.

ADVANCE INTERSECTION DESTINATION



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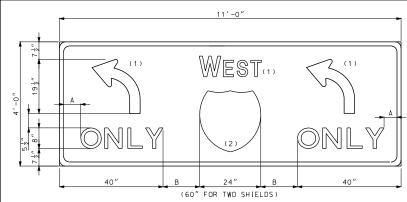


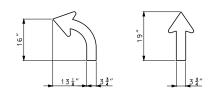
HIGHWAY SIGNING STRUCTURAL SIGNS MISC. GOUND MOUNTED FREEWAY AND EXPRESSWAY GUIDE SIGNS

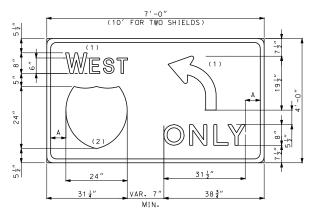
DATE EFFECTIVE: 02/01/2012 DATE PREPARED:

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SHEET NO. 4 OF 19







NOTES:

SHEILD SHALL APPEAR ON THE EXIT SIDE OF SIGN.

SIGN ALWAYS PLACED OVERHEAD. MOUNT ON BRIDGE WHEREVER POSSIBLE.

- (1) ALL CARDINAL DIRECTIONS AND ARROWS HORIZONTALLY CENTERED IN SPACE PROVIDED.
- (2) ALTERNATE ROUTE SHIELDS MAY BE PROVIDED. USE STANDARD 24" OR 30" SHIELD IN SPACE PROVIDED.

A = VARIABLE SO THAT THE OVERALL SIGN WIDTH IS IN 12" INCREMENTS . MINIMUM 6".

B = VARIABLE, MINIMUM 7".

BORDER (ALL SIGNS)					
CORNER RADII	WIDTH				
SIGN HEIGHT	INCHES	LETTER SIZE	INCHES		
LESS THAN OR EQUAL TO 6'	6	LESS THAN 12"	1		
7′	9				
GREATER THAN OR EQUAL TO 8'	12	12" OR LARGER	2		

BACKGROUND REFLECTIVE SHEETING

R2 REFER TO MISSOURI SPECIFICATION SECTION 1042.2.7.2 R4 REFER TO MISSOURI SPECIFICATION SECTION 1042.2.7.3

	GEN	GENERAL SIGN DATA				
STR2L-3	TYPE	REFLECTIVE SHEETING TYPE	COLOR	LETTER SERIES		
BACKGROUND		R2	GREEN			
LEGEND	L-3	R4	WHITE	E(M)		
SYMBOLS	L-3	R4	VAR.			
BORDER	L-3	R4	WHITE			
SUBSTRATE	STRU	CTURAL				

LEGEND, SYMBOLS & BORDER

L-3 DIRECT APPLIED (CUT FROM MATERIAL SHOWN ON PLANS.)



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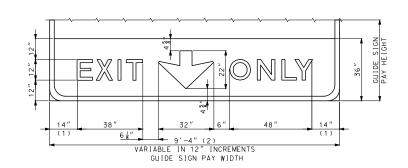
HIGHWAY SIGNING STRUCTURAL SIGNS LANE CONTROL

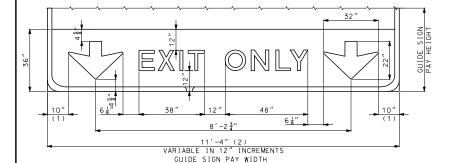
WITH ROUTE SHIELD

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SHEET NO. 5 OF 19





- (1) TYPICALLY VARY THIS DISTANCE TO MATCH WIDTH OF GUIDE SIGN.
- (2) MINIMUM GUIDE SIGN WIDTH WHEN EXIT ONLY PANEL IS CONTROL LINE FOR SIGN WIDTH.

BORDER (ALL SIGNS)				
CORNER RADII	WIDTH			
SIGN HEIGHT	INCHES	LETTER SIZE	INCHES	
LESS THAN OR EQUAL TO 6'	6	LESS THAN 12"	1	
7 ′	9			
GREATER THAN OR EQUAL TO 8'	12	12" OR LARGER	2	

BACKGROUND REFLECTIVE SHEETING

R4 REFER TO MISSOURI SPECIFICATION SECTION 1042.2.7.3

GENERAL SIGN DATA						
STR4L-1	TYPE	REFLECTIVE LET				
BACKGROUND		R4	FL. YL.			
LEGEND	L-1		BLACK	E (MOD)		
SYMBOLS	L-1		BLACK			
BORDER	L-1		BLACK			
SUBSTRATE	STRU	TURAL				

LEGEND. SYMBOLS AND BORDER

L-1 SCREEN PRINT, REVERSE SCREEN PRINT, OPAQUE OR TRANSLUCENT CUTABLE FILMS AS APPROVED BY ENGINEER BASED ON SIGN COLOR COMBINATION.

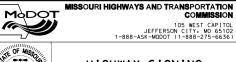
GUIDE SIGN PAY HEIGHT 24"		EXIT		ONLY		6" 12" 6"	
-	15"	38"	12"	48"	15"	_	
	7'-4" (2)						
VARIABLE IN 12" INCREMENTS GUIDE SIGN PAY WIDTH							

GENERAL NOTES:

NO DIRECT PAY MADE FOR THIS PANEL. COST FOR PANEL IS INCLUDED IN THE COST FOR THE GUIDE SIGN TO WHICH THIS PANEL IS ATTACHED.

FOR OVERHEAD USE ONLY.

PLACE SIGN ON TRUSS TO ALIGN CENTER OF LANE WITH TYPE C ARROW.





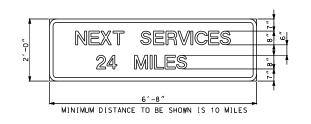
HIGHWAY SIGNING STRUCTURAL SIGNS

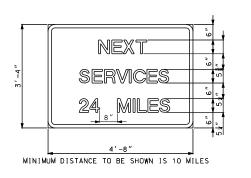
EXIT ONLY PANELS

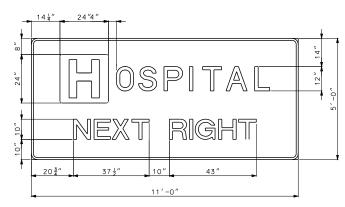
DATE EFFECTIVE: 02/01/2012 DATE PREPARED: 12/22/2011

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SHEET NO. 6 OF 19







NOTE: FOR THE LETTER "H" USE THE D9-2 SIGNFACE AS A DEMOUNTABLE SHIELD.

12"__ 24" 30" NEXTI2" RIGHT 20뜮" 78 <u>‡</u>" 6'-8"

> INTERSTATE - USE "EXIT XX"
> FREEWAY - USE "NEXT RIGHT" "SECOND RIGHT" (1) TO BE USED IN CONFORMANCE WITH MANUAL ON UNIFORM TRAFFIC CONTROL.

NOTE: HORIZONTALLY CENTER ALL LINES OF TEXT AND SYMBOLS.

BORDER (ALL SIGNS)						
CORNER RADII						
SIGN HEIGHT INCHES						
6	LESS THAN 12"	1				
9						
12	12" OR LARGER	2				
	INCHES 6 9	WIDTH INCHES LETTER SIZE 6 LESS THAN 12" 9				

BACKGROUND REFLECTIVE SHEETING

R2 REFER TO MISSOURI SPECIFICATION SECTION 1042.2.7.2 R4 REFER TO MISSOURI SPECIFICATION SECTION 1042.2.7.3

GENERAL SIGN DATA							
STR2L-3	TYPE	REFLECTI'SHEETING T	VE YPE	COLOR	LETTER SERIES		
BACKGROUND		R2		BLUE			
LEGEND	L-3	R4		WHITE	E(M)		
SYMBOLS	L-3	R4		WHITE			
BORDER	L-3	R4		WHITE			
SUBSTRATE	STRU	CTURAL					

LEGEND, SYMBOLS & BORDER

L-3 DIRECT APPLIED (CUT FROM MATERIAL SHOWN ON PLANS.)

MODOT	MISSOURI HIGHWAYS AND TRANSPORTATION Commission
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OF MISSO	HIGHWAY SIGNING



STRUCTURAL SIGNS SERVICE SIGNS

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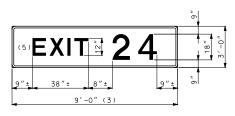
903.02AL

7 OF 19

SHEET NO.

(1) 9'- 0" 2 THROUGH 9 WITH A LETTER 11'- 0" FOR "EXITS" 2 THROUGH 9 WITH A-B LETTERS

1 THROUGH 9



(3) 9'- 0" WITH NUMBER 1 NUMERAL 11'- 0" WITH A LETTER

11 - U WITH A LLITER
10'- O" WITH A NUMBER 1 NUMERAL AND A LETTER
12'- O" FOR "EXITS" WITH A NUMBER 1 NUMERAL AND
A-B LETTERS
13'- O" FOR "EXITS" WITH DOUBLE NUMERAL AND
A-B LETTERS

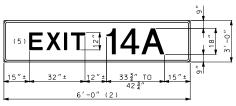
20 THROUGH 99

BORDER (ALL SIGNS) CORNER RADII WIDTH SIGN HEIGHT INCHES LETTER SIZE INCHES LESS THAN OR EQUAL TO 6 LESS THAN 12 GREATER THAN OR EQUAL TO 8' 12 12" OR LARGER

LEGEND, SYMBOLS & BORDER L-3 DIRECT APPLIED (CUT FROM MATERIAL SHOWN ON PLANS.)

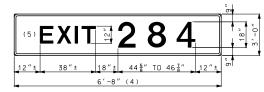
BACKGROUND REFLECTIVE SHEETING

R2 REFER TO MISSOURI SPECIFICATION SECTION 1042.2.7.2
R4 REFER TO MISSOURI SPECIFICATION SECTION 1042.2.7.3



(2) 12'- 0" FOR "EXITS" 10 THROUGH 19 NUMERAL WITH A-B LETTERS

10 THROUGH 19 NUMERAL WITH LETTER



(4) 10'- 0" WITH NUMBER 1 NUMERAL 12'- 0" WITH A LETTER 12'- 0" WITH A NUMBER 1 NUMERAL AND A LETTER

13'- O" FOR "EXITS" WITH A TRIPLE NUMERAL

WITH A NUMBER 1 NUMERAL AND A-B LETTERS

14'- O" FOR "EXITS" WITH A TRIPLE

NUMERAL AND A-B LETTERS

100 AND OVER

GENERAL NOTES:

FOR MOUNTING DETAILS SEE OTHER DRAWINGS.

PANEL SHALL BE MOUNTED DIRECTLY TO THE TOP OF THE GUIDE SIGN AND ALIGNED WITH THE EXIT SIDE.

GENERAL SIGN DATA REFL. SHEETING TYPE COLOR SERIES STR2L-3 TYPE GROUND OVERHEAD BACKGROUND R2 GREEN WHITE E(M) LEGEND R4 R4 R4 SYMBOLS L-3 R4 VAR. R4 BORDER R4 WHITE L-3 SUBSTRATE STRUCTURAL

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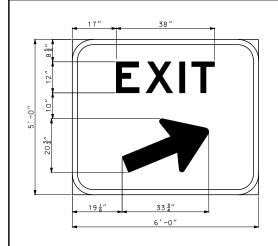
HIGHWAY SIGNING

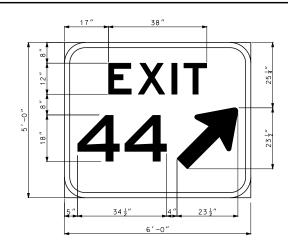
EXIT NUMBER PANELS

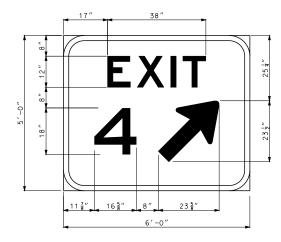
DATE EFFECTIVE: 02/01/2012 DATE PREPARED:

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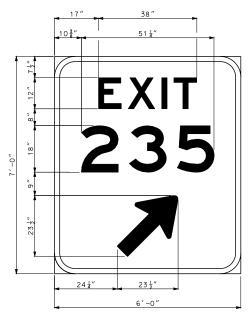
SHEET NO. 8 OF 19







		17"	38"	— ▶ 1
		6"	60″	
1	∞ - 4			
	12 "			T III
			- / I	
	e = 1			. —
	18,"		35	B
, 0- , 2	=			
۷,	<u>.</u> 6			
	<u>*</u>			
	*.			
	23 ½"			
	.			
	, —		T	/\
•		24 ¼"	23 ½″	
		•	6′-0″	



BORDER (ALL SIGNS)						
CORNER RADII	WIDTH					
SIGN HEIGHT	INCHES	LETTER SIZE	INCHES			
LESS THAN OR EQUAL TO 6'	6	LESS THAN 12"	1			
7 ′	9					
GREATER THAN OR EQUAL TO 8'	12	12" OR LARGER	2			

GENERAL SIGN DATA								
			EETING TYPE		LETTER			
STR2L-3	TYPE	GROUND	OVERHEAD	COLOR	SERIES			
BACKGROUND		R2	R2	GREEN				
LEGEND	L-3	R4	R4	WHITE	E(M)			
SYMBOLS	L-3	R4	R4	VAR.				
BORDER	L-3	R4	R4	WHITE				
SUBSTRATE	STRU	CTURAL						

SUBSTRATE ST STRUCTURAL SH SHEET

BACKGROUND REFLECTIVE SHEETING

R2 REFER TO MISSOURI SPECIFICATION SECTION 1042.2.7.2 R4 REFER TO MISSOURI SPECIFICATION SECTION 1042.2.7.3

GENERAL NOTE:

FOR MOUNTING DETAILS. SEE OTHER DRAWINGS.



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HIGHWAY SIGNING

ELEEN H.
RACKERS
NUMBER
PE-28336 PE-28338 E

GORE EXIT SIGN

DATE EFFECTIVE: 02/01/2012 DATE PREPARED:

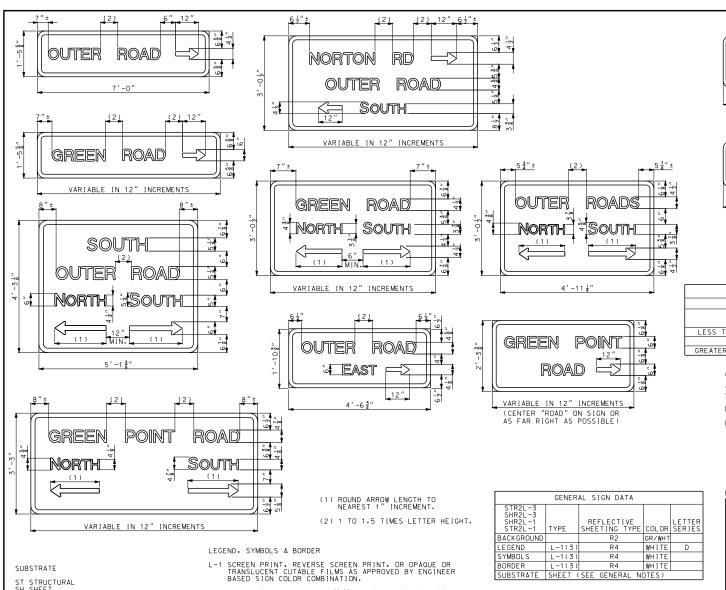
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SHEET NO. 9 OF 19

LEGEND, SYMBOLS & BORDER

L-1 SCREEN PRINT, REVERSE SCREEN PRINT, OR OPAQUE OR TRANSLUCENT CUTABLE FILMS AS APPROVED BY ENGINEER BASED SIGN COLOR COMBINATION.

L-3 DIRECT APPLIED (CUT FROM MATERIAL SHOWN ON PLANS.)







MAST ARM STREETNAME SIGNS

BORDER (ALL SIGNS)					
CORNER RADII	WIDTH				
SIGN HEIGHT	INCHES	LETTER SIZE	INCHES		
LESS THAN OR EQUAL TO 6'	6	LESS THAN 12"	1		
7′	9				
GREATER THAN OR EQUAL TO 8'	12	12" OR LARGER	2		

GENERAL NOTES:

SIGNS GREATER THAN 6^{\prime} WIDE OR 30 SQ. FT. IN AREA SHALL BE STRUCTURAL.

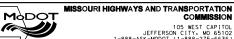
MAST ARM STREETNAME SIGNS SHALL BE FLAT SHEET. FLAT SHEET FOR SIGNS SHALL BE THE FOLLOWING

9 SQUARE FEET OR LESS - .080 IN..

OVER 9 SOUARE FEET BUT LESS THAN 16 SOUARE FEET - .100 IN.,

16 SQUARE FEET OR LARGER - .125 IN.

FOR MOUNTING DETAILS, SEE OTHER DRAWINGS.



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HIGHWAY SIGNING

CROSS ROAD AND OUTER ROAD SIGNS

DATE EFFECTIVE: 02/01/2012 DATE PREPARED:

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SHEET NO.

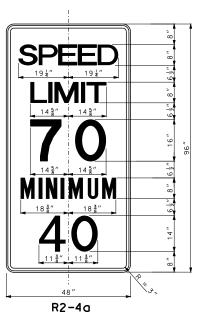
CROSS ROAD AND OUTER ROAD SIGNS

ST STRUCTURAL SH SHEET

R2 REFER TO MISSOURI SPECIFICATION SECTION 1042.2.7.2 R4 REFER TO MISSOURI SPECIFICATION SECTION 1042.2.7.3

BACKGROUND REFLECTIVE SHEETING

L-3 DIRECT APPLIED (CUT FROM MATERIAL SHOWN ON PLANS.)



FOR USE ON INTERSTATE ONLY

	GENERAL SIGN DATA; R2-4a					
SHR2L-1	TYPE	REFLECTIVE SHEETING TYPE	COLOR	LETTER SERIES		
BACKGROUND		R2	WHITE			
LEGEND	L-1		BLACK	С		
SYMBOLS	L-1		BLACK			
BORDER	L-1		BLACK			
SUBSTRATE	SHEE	Т				

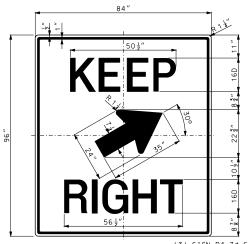
LEGEND, SYMBOLS & BORDER

L-1 SCREEN PRINT, REVERSE SCREEN PRINT, OR OPAQUE OR TRAN-SLUCENT CUTABLE FILMS AS APPROYED BY ENGINEER BASED ON SIGN COLOR COMBINATION.

L-3 DIRECT APPLIED (CUT FROM MATERIAL SHOWN ON PLANS.)

BACKGROUND REFLECTIVE SHEETING

R2 REFER TO MISSOURI SPECIFICATION SECTION 1042.2.7.2



(3) SIGN R4-7d SHALL BE STRUCTURAL

R4-7d KEEP RIGHT

(WITH 30° ARROW) FREEWAY/EXPRESSWAY

	GENERAL SIGN DATA; R4-7b					
STR2L-1	TYPE	REFLECTIVE SHEETING TYPE	COLOR	LETTER SERIES		
BACKGROUND		R2	WHITE			
LEGEND	L-1		BLACK	D		
SYMBOLS	L-1		BLACK			
BORDER	L-1		BLACK			
SUBSTRATE	SUBSTRATE STRUCTURE					

GENERAL NOTES:

FLAT SHEET FOR SIGNS SHALL BE THE FOLLOWING THICKNESS (EXCEPT FOR 36" STOP SIGN THAT USES AN .100 ALUMINUM PLATE):

9 SQUARE FEET OR LESS - .080 IN.,

OVER 9 SQUARE FEET TO 16 SQUARE FEET - .100 IN.,

16 SQUARE FEET OR LARGER - .125 IN.

FOR MOUNTING DETAILS, SEE OTHER DRAWINGS.



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HIGHWAY SIGNING

REGULATORY SIGNS

DATE EFFECTIVE: 02/01/2012 DATE PREPARED: 12/22/2011

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SHEET NO. 11 OF 19

GENERAL SIGN DATA; FLAT SHEET					
	REFLECTIVE				
SHR4L-1	TYPE	SHEETING TYPE	COLOR		
BACKGROUND		R4	FL. YL		
LEGEND	L-1		BLACK		
SYMBOLS	L-1		BLACK		
BORDER	L-1		BLACK		

GENERAL SIGN DATA; STRUCTURE						
STR4L-1	COLOR					
BACKGROUND		R4	FL. YL			
LEGEND	L-1		BLACK			
SYMBOLS	L-1		BLACK			
BORDER	L-1		BLACK			

LEGEND, SYMBOLS & BORDER

L-1 SCREEN PRINT, REVERSE SCREEN PRINT, OR OPAQUE OR TRAN-SLUCENT CUTABLE FILMS AS APPROVED BY ENGINEER BASED ON SIGN COLOR COMBINATION.

L-3 DIRECT APPLIED (CUT FROM MATERIAL SHOWN ON PLANS.)

BACKGROUND REFLECTIVE SHEETING

R4 REFER TO MISSOURI SPECIFICATION SECTION 1042.2.7

SUBSTRATE

SH FLAT SHEET

ST EXTRUDED PANEL

GENERAL NOTES:

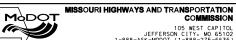
FLAT SHEET FOR SIGNS SHALL BE THE FOLLOWING THICKNESS

9 SQUARE FEET OR LESS - .080 IN..

OVER 9 SQUARE FEET TO 16 SQUARE FEET - .100 IN..

16 SQUARE FEET OR LARGER - .125 IN.

FOR MOUNTING DETAILS, SEE OTHER DRAWINGS.



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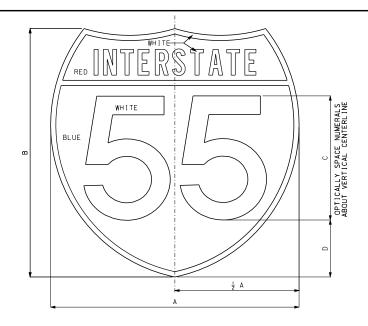
HIGHWAY SIGNING

WARNING SIGNS

DATE EFFECTIVE: 02/01/2011 DATE PREPARED: 12/22/2011

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SHEET NO. 12 OF 19





FOR GUIDE SIGN USE

LOCATION	SIGN	DIME	DIMENSIONS (INCHES)			
LUCATION	31 GN	Α	В	С	D	
CROSSROAD	1.2-DIGITS	24	24	12D	5 ½	
OVERHEAD	1,2-DIGITS	36	36	18D	8 4	
GROUND MOUNT	1.2-DIGITS	48	48	24D	11	
CROSSROAD	3-DIGITS	30	24	12D	5 ½	
OVERHEAD	3-DIGITS	45	36	18D	8 4	
GROUND MOUNT	3-DIGITS	60	48	24D	11	

DIMENSIONS FOR GUIDE SIGN. BUSINESS LOOP OR SPUR SHIELDS

GUIDE SIGN						
	GENE	RAL SIGN DATA				
	REFLECTIVE LETTER TYPE SHEETING TYPE COLOR SERIES					
BACKGROUND	L-1	R4	VAR.			
LEGEND	L-1 *		WHITE	VAR **		
SYMBOLS						
BORDER	L-1 *		WHITE			
SUBSTRATE	SUBSTRATE					

* REVERSE SCREEN PROCESS. ** SEE DIMENSION TABLES THIS DRAWING.

INTERSTATE SHIELD

LEGEND. SYMBOLS & BORDER

L-1 SCREEN PRINT, REVERSE SCREEN PRINT, OR OPAQUE OR TRAN-SLUCENT CUTABLE FILMS AS APPROVED BY ENGINEER BASED

SUBSTRATE

ST STRUCTURAL SH SHEET

ON SIGN COLOR COMBINATION.

SIGN	DIMENSIONS (INCHES)					
	31014	Α	В	С	D	E
	1 & 2 DIGITS	24	24	1 ½ D	1 3/8	10D
	3 DIGITS	30	24	1 ½ D	2 ¼	10D

DIMENSIONS FOR INDEPENDENT USE SHIELD

	INDEPENDENT					
	GENE	RAL SIGN DATA				
SHR2L-1	SHR2L-1 TYPE SHEETING TYPE COLOR SERIES					
BACKGROUND	L-1	R2	VAR.			
LEGEND	L-1 *		WHITE	VAR **		
SYMBOLS						
BORDER	L-1 *		WHITE			
SUBSTRATE	SHEET					

* REVERSE SCREEN PROCESS.

** SEE DIMENSION TABLES THIS DRAWING.

BACKGROUND REFLECTIVE SHEETING

R2 REFER TO MISSOURI SPECIFICATION SECTION 1042.2.7.2 R4 REFER TO MISSOURI SPECIFICATION SECTION 1042.2.7.3

GENERAL NOTES:

ALL SHIELDS FOR GUIDE SIGN USE SHALL BE SCREEN PROCESS OR ELECTRONIC CUTABLE FILM ON REFLECTIVE SHEETING IN ACCORDANCE WITH SEC 1042.2.7.3.

FOR HOLE PUNCHING AND MOUNTING DETAILS SEE OTHER DRAWINGS.

OCCASSIONALLY THE NUMERALS CANNOT BE ACCOMODATED WITHIN THE SPACE AVAILABLE ON THE STANDARD SHIELD. FOR THESE SITUATIONS, THE STANDARD SERIES D NUMERAL MAY BE REDUCED TO SERIES C. OR HORIZONTALLY COMPRESSED

BY MEANS OF SIGNING SOFTWARE AS DIRECTED BY THE ENGINEER.

ALL SIGNS ON THIS SHEET ARE TO BE FABRICATED FROM .080 IN. SHEET ALUMINUM, UNLESS OTHERWISE SHOWN.



MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)



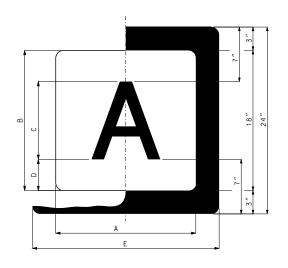
HIGHWAY SIGNING

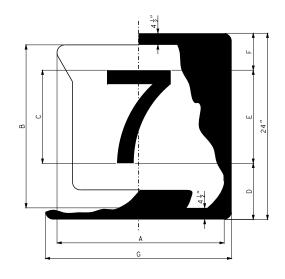
SHIELD FOR INDEPENDENT AND GUIDE SIGN USE

DATE EFFECTIVE: 02/01/2012 DATE PREPARED: 12/22/2011

903.02AL

SHEET NO. 13 OF 19





LOCATION	NO. OF LETTERS	DIMENSIONS (INCHES) FOR GUIDE SIGN USE			
	LETTERS	Α	В	С	D
CROSSROAD	1	24	24	12D	6
CROSSROAD	2	30	24	12D	6
OVERHEAD	1	30	30	18D	6
OVERHEAD	2	36	30	18D	6
GROUND MOUNT	1	42	42	24D	9
GROUND MOUNT	2	48	42	24D	9

NUMBER	DIMENSIONS FOR INDEPE	(INCHES) ENDENT USE
LETTERS	С	E
1	12D	24
2	120	30

SUPPLEMENTARY SHIELD

LOCATION	ROUTE NUMBER	DIMENSIONS (INC FOR GUIDE SIGN		(NCHES) GN USE
	NOMBER	Α	В	С
CROSSROAD	1 & 2 DIGITS	24	24	12D
OVERHEAD	1 & 2 DIGITS	36	36	18C
GROUND MOUNT	1 & 2 DIGITS	48	48	24D
CROSSROAD	3 DIGITS	30	24	12C
OVERHEAD	3 DIGITS	45	36	18D
GROUND MOUNT	3 DIGITS	60	48	24D

ROUTE	D I F O	DIMENSIONS (INCHES) FOR INDEPENDENT USE								
NUMBER	D	E	F	G						
1 & 2 DIGIT	7 4	12D	4 3/4	24						
3 DIGIT	8 4	12 B OR C	5 3	30						

STATE ROUTE SHIELD

GUIDE SIGN								
GENERAL SIGN DATA								
	COLOR	REFLECTIVE SHEETING TYPE	LETTER SERIES					
BACKGROUND	WHITE	R4						
LEGEND	BLACK		VAR *					
SYMBOLS	WHITE							

INDEPENDENT									
GENERAL SIGN DATA									
SHR2L-1	COLOR	REFLECTIVE SHEETING TYPE	LETTER SERIES						
BACKGROUND	WHITE	R2							
LEGEND	BLACK		VAR *						
SYMBOLS	WHITE								
BORDER	BLACK								
SUBSTRATE	SHEE	Т							

* SEE DIMENSION TABLES THIS DRAWING.

LEGEND. SYMBOLS & BORDER

SUBSTRATE ST STRUCTURAL SH SHEET L-1 SCREEN PRINT, REVERSE SCREEN PRINT, OR OPAQUE OR TRAN-SLUCENT CUTABLE FILMS AS APPROVED BY ENGINEER BASED ON SIGN COLOR COMBINATION.

BACKGROUND REFLECTIVE SHEETING

R2 REFER TO MISSOURI SPECIFICATION SECTION 1042.2.7.2
R4 REFER TO MISSOURI SPECIFICATION SECTION 1042.2.7.3

GENERAL NOTES:

ALL SHIELDS FOR GUIDE SIGN USE SHALL BE SCREEN PROCESS OR CUTTABLE FILM ON REFLECTIVE SHEETING IN ACCORDANCE WITH SEC 1042.2.7.3.

ALL SHIELDS FOR INDEPENDENT SIGN USE SHALL BE SCREEN PROCESS OR CUTTABLE FILM ON REFLECTIVE SHEETING IN ACCORDANCE WITH SEC 1042.2.7.2.

FOR HOLE PUNCHING AND MOUNTING DETAILS SEE OTHER DRAWINGS.

LAYOUT OF MISSOURI SHIELDS ARE AVAILABLE UPON REQUEST.

OCCASIONALLY THE NUMERALS CANNOT BE ACCOMMODATED WITHIN THE SPACE AVAILABLE ON THE STANDARD SHIELD. FOR THESE SITUATIONS, THE STANDARD SERIES D NUMERAL MAY BE REDUCED TO SERIES C. OR HORIZONTALLY COMPRESSED BY MEANS OF SIGNING SOFTWARE AS DIRECTED BY THE ENGINEER.

ALL SIGNS ON THIS SHEET ARE TO BE FABRICATED FROM .080 IN. SHEET ALUMINUM, UNLESS OTHERWISE SHOWN.



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HIGHWAY SIGNING STANDARD SHIELDS FOR INDEPENDENT AND GUIDE SIGN USE

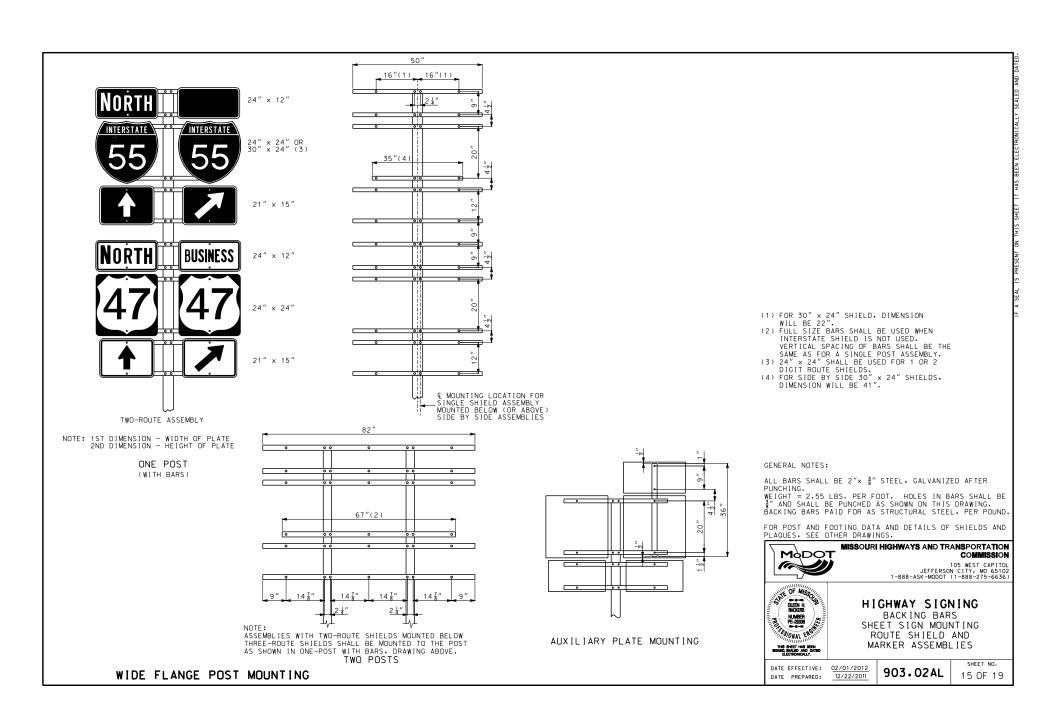
DATE PREPARED:

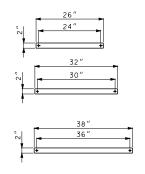
DATE EFFECTIVE: 02/01/2012

903.02AL

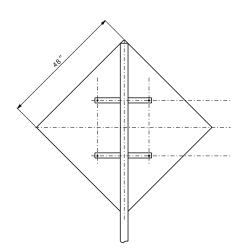
14 OF 19

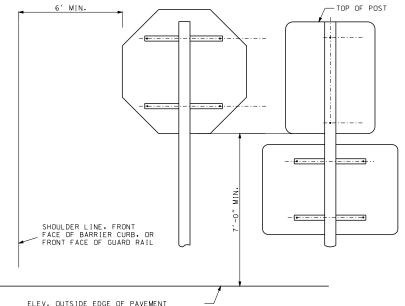
SHEET NO.





THE THREE BACKING BAR LAYOUTS FOR SINGLE POST SIGNS





ELEV. OUTSIDE EDGE OF PAVEMENT FOR CLAMP DETAILS, SEE OTHER DRAWINGS.

HOLES IN BACKING BARS SHALL BE $\frac{3}{8}$ " AND PUNCHED AS SHOWN ON THIS DRAWING.



MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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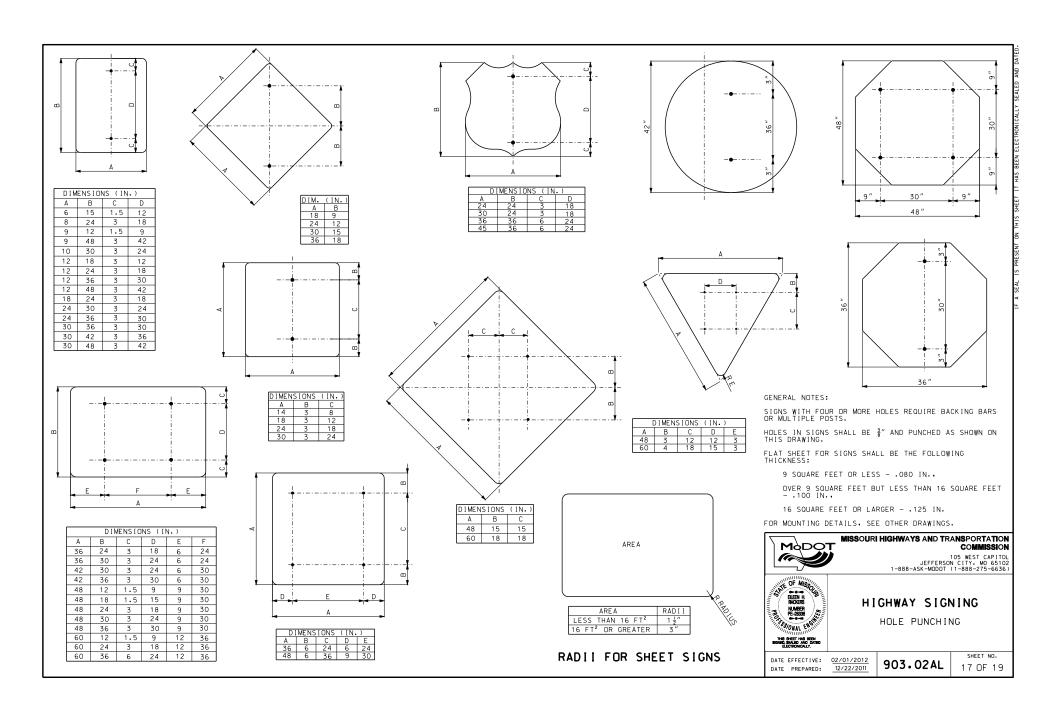
HIGHWAY SIGNING

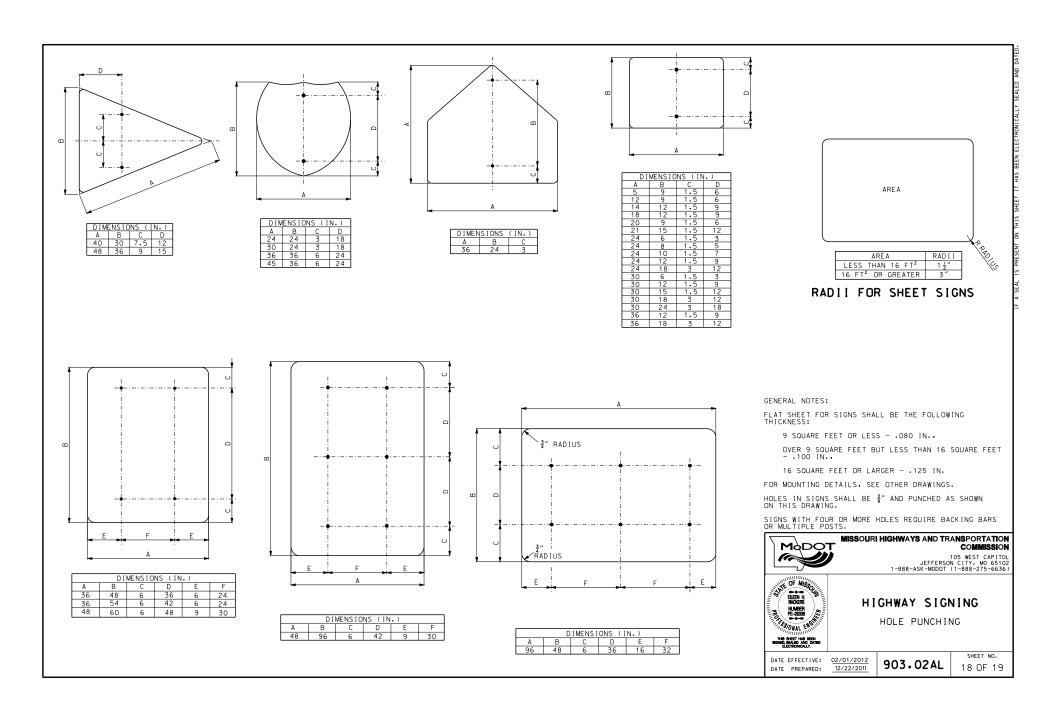
BACKING BARS DETAILS

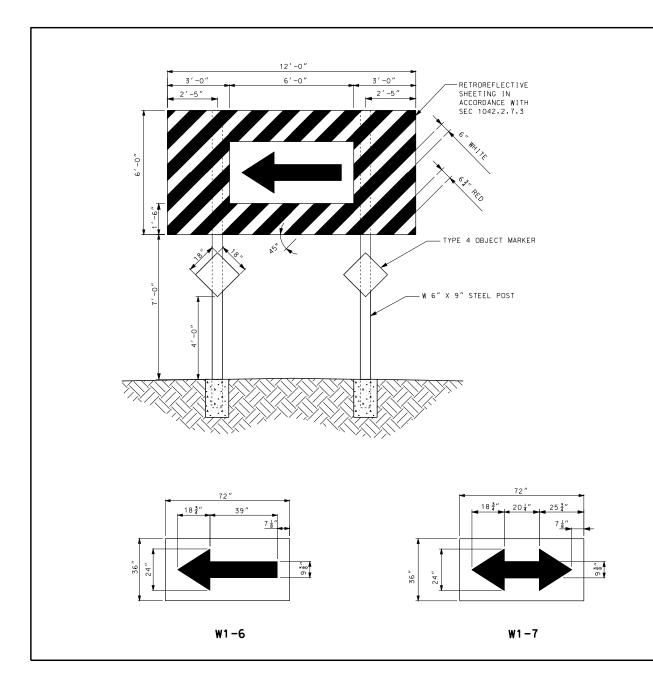
DATE EFFECTIVE: 02/01/2012 DATE PREPARED: 12/22/2011

903.02AL

SHEET NO. 16 OF 19







GENERAL NOTES:

SIGN BARRICADE SHALL BE CLASSIFIED AS STR4L-3 DESIGNATION.

WHERE A BARRICADE EXTENDS ACROSS A ROADWAY. THE STRIPES SHALL SLOPE DOWNWARD IN THE DIRECTION TOWARD WHICH TRAFFIC MUST TURN OR PASS.

WHERE BOTH RIGHT AND LEFT VEHICULAR MOVEMENTS ARE PROVIDED. THE BARRICADE STRIPES SHALL SLOPE DOWNWARD IN BOTH DIRECTIONS FROM THE CENTER OF THE BARRICADE.

WHERE VEHICULAR MOVEMENTS ARE NOT PROVIDED. THE STRIPES SHALL SLOPE DOWNWARD TOWARD THE CENTER OF THE BARRICADE.

ALL REFLECTORIZED SURFACES SHALL BE RETROREFLECTIVE SHEETING IN ACCORDANCE WITH SEC 1042.2.7.3.

SEE STANDARD PLAN 903.03 FOR BREAKAWAY ASSEMBLY AND TYPE 4 OBJECT MARKER.



DATE EFFECTIVE: 02/01/2012 DATE PREPARED: 12/22/2011

THE SHEET HAS BEEN SIGNED SEALED AND DATED ELECTRONICALLY

903.02AL

SHEET NO. 19 OF 19

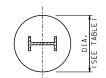
	STRUCT	TUAL STEEL F	ost	FOF	R GR	DUND	MOU	INTE) SI	GNS	
POST DES. NO.*	NOM S I Z E	TORQUE AND HIGH STRENGTH		BASE CONNECTION DATA TABLE (IN.)							
NO.*	(IN.)(LBS/FT)	DOL TO	Α	В	С	D	Е	F	G	W	R
1	₩6×9	훍" ROUND									
2	W6×15	× 2 ¾"	5	2	1 4	2 3/4	1 🖁	<u>3</u>	1/2	4	11,32
3	₩8×18	345 IN./LBS.									
4	W10x22	∄″ ROUND									
5	₩10×26	× 3½"	6	2 4	1 3	3 ½	1 4	1	3 4	5 16	13/32
6	W12×35	555 IN./LBS.									

				Р	OST A	ND I	FOOTI	NG [ATA	TABI	_E				
	POST						FOOTING								
	POST DES.	NOM. SIZE	WE I	GHT	STUB LENGTH	DIA.	LE V GROU		6:1 G	RADE	4:1 GF	RADE	3:1 O GRA		
	NO. *	JIZL	LBS/FT	LBS/IN			DEPTH	С.Ү.	DEPTH	С.Ү.	DEPTH	С.Ү.	DEPTH	C.Y.	
	1	₩6	9.0	0.75	3'-0"	15"	3'-0"	0.14	3'-2"	0.15	3'-3"	0.16	3'-6"	0.17	
1	2	₩6	15.0	1.25	4'-0"	24"	4'-0"	0.47	4'-2"	0.50	4'-3"	0.51	4'-6"	0.54	
	3	₩8	18.0	1.50	4'-6"	28"	4′-6″	0.71	4′-8″	0.73	4′-9″	0.74	5'-0"	0.78	
	4	₩10	22.0	1.83	5'-0"	36"	5′-0″	1.31	5′-2″	1.36	5'-3"	1.39	5′-6″	1.45	
J	5	₩10	26.0	2.17	5'-0"	36"	5′-0″	1.31	5′-3″	1.37	5′-5″	1.43	5′-9″	1.52	
	6	₩12	35.0	2.92	5'-6"	36"	5′-6″	1.44	5′-9″	1.52	5'-11"	1.56	6'-3"	1.65	

SHEET METAL BOLT RETAINER CUT FROM 30 GAGE GALVANIZED SHEET METAL. PLACE
BETWEEN BASE PLATES. SIZE VARIES TO
FIT PLATE. BOLT HOLES TO BE & LARGER THAN REQUIRED BOLT SIZE.



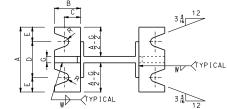
* FOR POST DESIGNS NUMBERS 3, 4, 5 AND 6 HOW PUST DESIGNS NUMBERS 3, 4, 5 AND 6 HAVING WEIGHTS GREATER THAN 18LBS./FT., POSTS SHALL BE SPACED AT LEAST 7' APART. FOR POST DESIGNS NUMBERS 1 AND 2. POSTS MAY BE SPACED LESS THAN 7' APART. DO NOT USE THREE NUMBER 1 OR 2 POSTS WITH A SIGN WIDTH OF LESS THAN 10'-6".

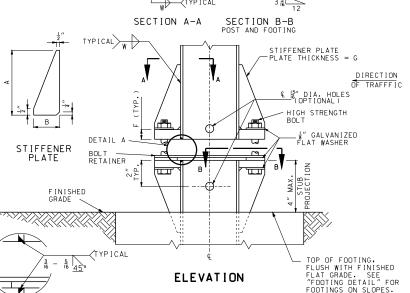


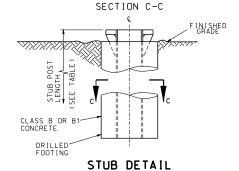
BOLT RETAINER

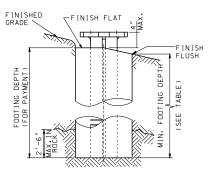


DETAIL A









FOOTING DETAIL

GENERAL NOTES:

DESIGN SPECS: AASHTO STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS. LUMINAIRES AND TRAFFIC SIGNALS - 1985 (EXCEPT 2001AND LATEST INTERIMS FOR STRUCTURAL STEEL POSTS).

POSTS, PERFORATED FUSE PLATE AND SPLICE PLATE TO BE GALVANIZED AFTER FABRICATION.

METAL PROJECTING BEYOND THE PLANE OF THE PLATE FACE WILL NOT BE ALLOWED.

REMOVE ALL GALVANIZING RUNS OR BEADS IN THE WASHER

ALL STRUCTURAL STEEL STIFFENER PLATES AND BASE PLATES.
FOR GROUND MOUNTED SIGNS SHALL MEET THE REQUIREMENTS OF ASTM A 36 OR AASHTO M 270 GRADE 50, MINIMUM YIELD 50,000 PSI.

IN THE EVENT THE DISTANCE BETWEEN THE TOP OF THE FOOT-ING AND THE BOTTOM OF THE SIGN IS LESS THAN 7'-9". THE SIGN HEIGHT AND POST LENGTH IS TO BE INCREASED SUFFICIENTLY TO ACCOMMODATE THIS MINIMUM SPACING.

HINGE PLATES NOT REQUIRED ON SINGLE POST SIGNS OR ANY SIGNS USING PIPE POSTS.

NUTS ON HINGE PLATE BOLTS SHALL BE TIGHTENED TO THE REQUIRED MINIMUM BOLT TENSION VALUES SHOWN IN TABLE 1 SEC. 1080 OF THE STANDARD SPECIFICATIONS.

THE NUT SHALL BE FREE RUNNING. IF THE NUT WILL NOT SPIN ON THE BOLT BECAUSE OF GALVANIZING IRREGULARITIES. A LUBRICANT SHALL BE APPLIED.

ALL BREAKAWAY ASSEMBLY BOLTS SHALL BE TIGHTENED IN A SYSTEMATIC MANNER TO THE PRESCRIBED TORQUE SHOWN ON THIS DRAWING.

EACH BREAKAWAY ASSEMBLY BOLT SHALL BE LOOSENED AND RE-TIGHTENED TO THE REQUIRED TORQUE IN THE SAME ORDER AS THE INITIAL TIGHTENING.

THE THREADS SHALL BE BURRED AT THE NUT USING A CENTER PUNCH TO PREVENT NUT FROM LOOSENING.

POST LENGTH QUANTITY SHOWN ON PLANS INCLUDES STUB.

1" X 2 ½" HIGH STRENGTH BOLTS FOR PIPE POSTS SHALL BE OF THE DESIGNATION AASHTO M 164 OR ASTM A 449. ALL OTHER H.S. BOLTS SHALL BE OF THE DESIGNATION AASHTO M 164.

FURNISH TWO .012"± AND TWO .0032"± THICK SHIMS PER POST FROM BRASS SHIM STOCK OR STRIP, DESIGNATION ASTM B 36. SHIM AS REQUIRED TO PLUMB POST.

HIGH STRENGTH BOLTS WITH HEX NUT AND THREE WASHERS WITH EACH BOLT ARE TO BE GALVANIZED.

OPTIONAL HOLES (12 ROUND FOR "1" SHAPE POSTS AND 18 ROUND FOR PIPE POST BASE PLATES) AS SHOWN IN "ELE-VATIONS" ARE TO BE USED AS AID FOR GALVANIZING ONLY.



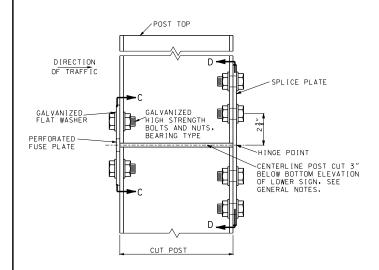
DATE EFFECTIVE: 02/01/2012 DATE PREPARED:

903.03BH

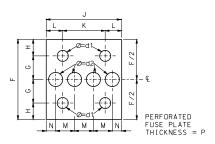
SHEET NO. 1 OF 11

WIDE	FLANG	E STRU	CTURAL	STEEL	POSTS	DESIG	N DATA				PEF	RFORA	TED	FUSE	PLAT	E DA	ATA T	ABLE					SPL	ICE	PLAT	E DA	ТА Т	ABLE	
POST DES.	NOM. SIZE	WEI	GHT	DEPTH	FL4	NGE THICK	WEB THICK	POST DESIGN	F	G	н	J	к	L	м	N	d1	d2	Р	BOLT DIA.	WT. (EA.)	POST DESIGN	J	К	L	U	d1	BOLT DIA.	WT.
NO.	(IN.)	LB/FT	LB/IN	(IN.)	(IN.)	(IN.)	(IN.)	NO.	(IN.)	(IN.)	(IN.)	(IN.)	(IN.)	(IN.)	(IN.)	(IN.)	(IN.)	(IN.)	(IN.)	(IN.)	(LBS.)	NO.	(IN.)	(IN.)	(IN.)	(IN.)	(IN.)	(IN.)	(LBS.)
1	W6	9	0.75	5 7 8	4	3 16	3 16	1	4 4	1	1 1/8	4	2 ¼	7 8	1	1/2	916	<u>3</u>	<u>3</u>	1/2	0.76	1	4	2 4	7 8	<u>3</u> 16	916	1/2	2.45
2	W6	15	1.25	6	6	1/4	14	2	5	1 4	1 4	6	3 ½	1 4	1 ½	<u>3</u>	116	1 4	1/4	<u>5</u>	1.67	2	6	3 ½	1 4	14	16 11	<u>5</u> 8	4.89
3	W 8	18	1.50	8 #	5 🕯	516	1/4	3	5	1 4	1 4	5 🛔	2 3	1 4	1 4	<u>3</u>	11 16	1 16	1/4	<u>5</u>	1.51	3	5 4	2 3	1 4	<u>5</u> 16	16	<u>5</u> 8	5.32
4	W 10	22	1.83	10	5 3	3 8	4	4	6	1 ½	1 ½	5 3	2 3/4	1 ½	1 3	13	1 <u>3</u> 16	1 🖁	<u>5</u> 16	3 4	2.52	4	5 3	2 3/4	1 ½	<u>5</u> 16	13 16	34	5.75
5	W 10	26	2.17	10 3	5 3	716	1/4	5	6	1 ½	1 1/2	5 3	2 3 4	1 ½	1 3/8	13	13 16	1 🖁	<u>5</u> 16	3 4	2.52	5	5 3	2 3/4	1 1/2	<u>7</u> 16	13 16	3 4	8.04
6	W12	35	2.92	12 ½	6 <u>1</u>	1/2	5 16	6	6	1 ½	1 ½	6 <u>1</u>	3 ½	1 ½	1 5	13	13 16	1 등	3 8	3 4	3.35	6	6 ½	3 ½	1 ½	1/2	13 16	3 4	10.47

THE WEIGHT OF STRUCTURAL STEEL POSTS SHOWN IN THE CONTRACT HAS BEEN COMPUTED USING THE WEIGHTS SHOWN.



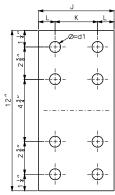
ELEVATION PERFORATED FUSE PLATE AND SPLICE PLATE DETAIL



ELEVATION C-C

ALL HOLES SHALL BE DRILLED. ALL PLATE CUTS SHALL PREFERABLY BE SAW CUTS. HOWEVER: FLAME CUTTING WILL BE PERMITTED PROVIDED ALL EDGES ARE GROUND.

PERFORATED FUSE PLATE AND SPICE PLATE SHALL BE FABRICATED FROM ASTM A 36 STRUCTURAL STEEL.



SPLICE PLATE THICKNESS = U

ELEVATION D-D

GENERAL NOTE:

FOR ROADWAYS WHERE TRAFFIC MAY STRIKE THE BACKSIDE OF THE POST, PERFORATED FUSE PLATES SHALL BE INSTALLED ON BOTH SIDES OF THE POST.



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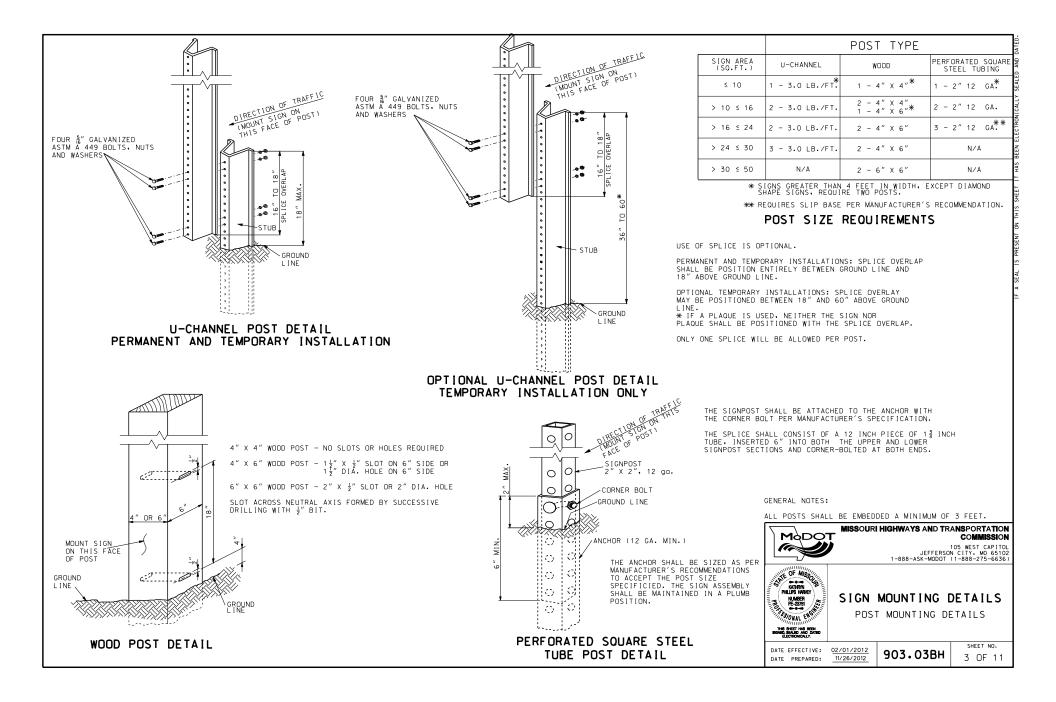
SIGN MOUNTING DETAILS BREAKAWAY ASSEMBLIES FOR

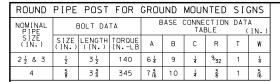
GROUND MOUNTED SIGNS

DATE EFFECTIVE: 02/01/2012 DATE PREPARED: 12/19/2011

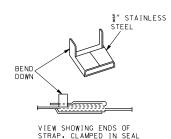
903.03BH

SHEET NO. 2 OF 11



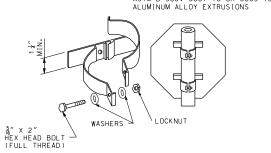


ROUN	D PIPE	POST	AND FOO)T I NG	DATA	TABLE
NOM.	WE I	GHT	STUB	F001	TING	CONCRETE
SIZE (IN.)	LBS/FT	LBS/IN	LĒŅĠŤĦ	DIA.	DEPTH	C.Y.
2 ½	5.79	0.48	4'- 3½"	12"	4′-6″	0.13
3	7.58	0.63	4'- 3½"	12"	4′-6″	0.13
4	10.79	0.90	5'- 3½"	18"	5′-6″	0.36



STRAP SEAL

着" × 着" STAINLESS STEEL HEX HEAD ALL THREAD ្នឹ" O.D. x ៉ូ THICK PLASTIC FIBER WASHER STAINLESS STEEL BRACKET MATERIAL 6 -훊" 18-NC TAPPED HOLE IN CENTER 0 > 8" × ∙025" STAINLESS STEEL STRAP MATERIAL



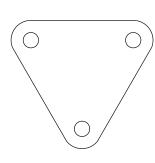
STAINLESS STEEL HARDWARE CLAMP TYPE SIGN SUPPORTS

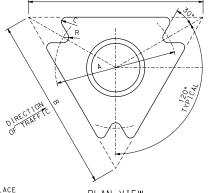
FOR PIPE POST

FLARED LEG SIGN BRACKET

CLASS B OR B1 CONCRETE

2' MAXIMUM IN ROCK, PIPE OVER 3" DIA.; 3' MAXIMUM IN ROCK

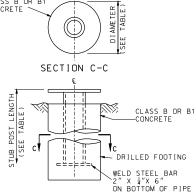




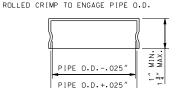
(STEEL PIPE POST BASE CONNECTION)

MULTI-DIRECTION SLIP BASE

В



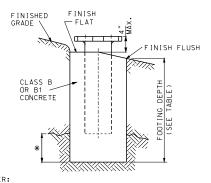
FOUNDATION DETAIL SLIP BASE ASSEMBLIES



FRICTION CAP

GENERAL NOTE:

REFER TO THE GENERAL NOTES ON SHEET 1.



FOOTING DETAIL

MODOT (A)

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

ASTM B 308, 6061-T6 OR 6063-T6

105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)



SIGN MOUNTING DETAILS

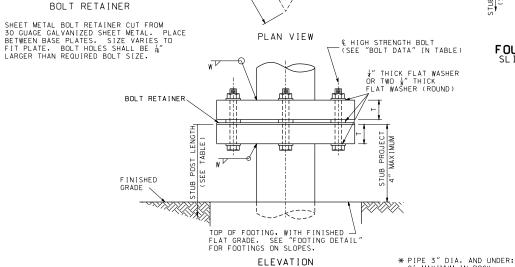
POST FOR SIGNS 30 SQUARE FEET OR SMALLER

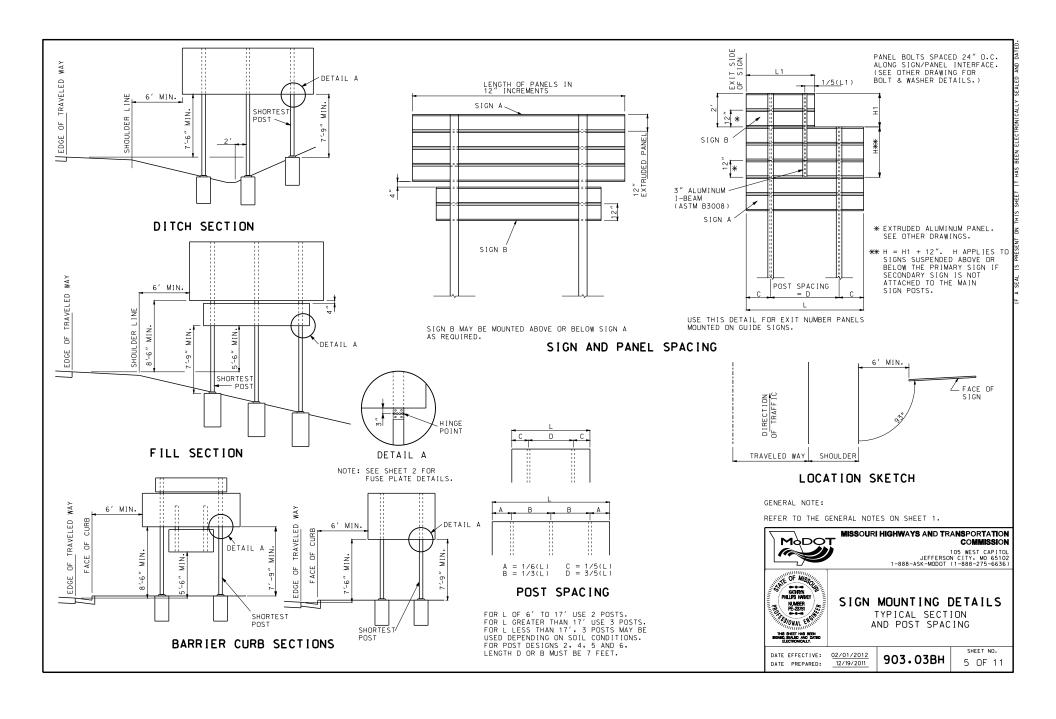
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DATE	PREPAR

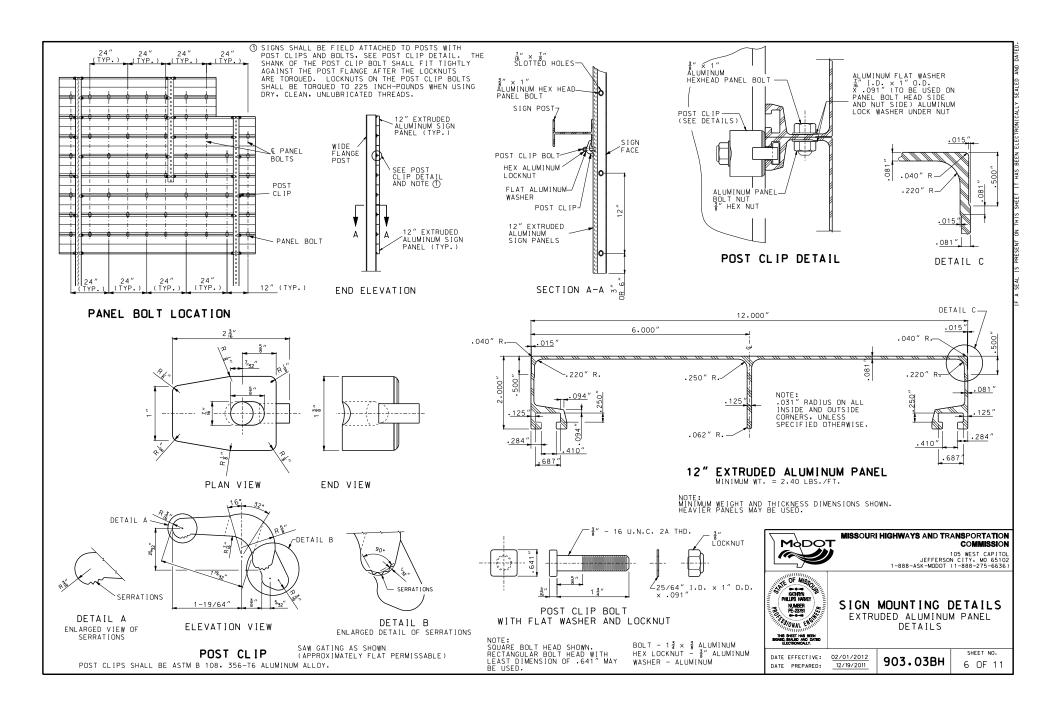
VE: 02/01/2012

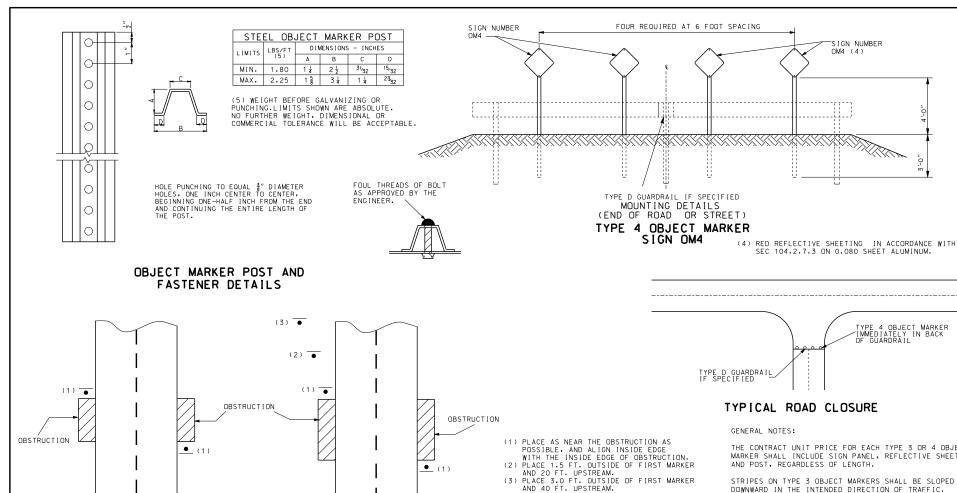
903.03BH

SHEET NO. 4 OF 11









<u>•</u> (2)

• (3)

OBSTRUCTION < 20' LONGITUDINALLY

OBSTRUCTION > 20' LONGITUDINALLY

TYPE 3 OBJECT MARKER SIGN OM3

WHERE FIELD CONDITIONS DO NOT ALLOW FOR THE 1.5 FT. AND 3.0 FT. LATERAL OFFSETS OF SIGNS (2) AND (3) RESPECTIVELY, THE SIGNS SHOULD BE OFFSET AS MUCH AS PRACTICABLE. THE CONTRACT UNIT PRICE FOR EACH TYPE 3 OR 4 OBJECT MARKER SHALL INCLUDE SIGN PANEL, REFLECTIVE SHEETING,

STRIPES ON TYPE 3 OBJECT MARKERS SHALL BE SLOPED DOWNWARD IN THE INTENDED DIRECTION OF TRAFFIC.



MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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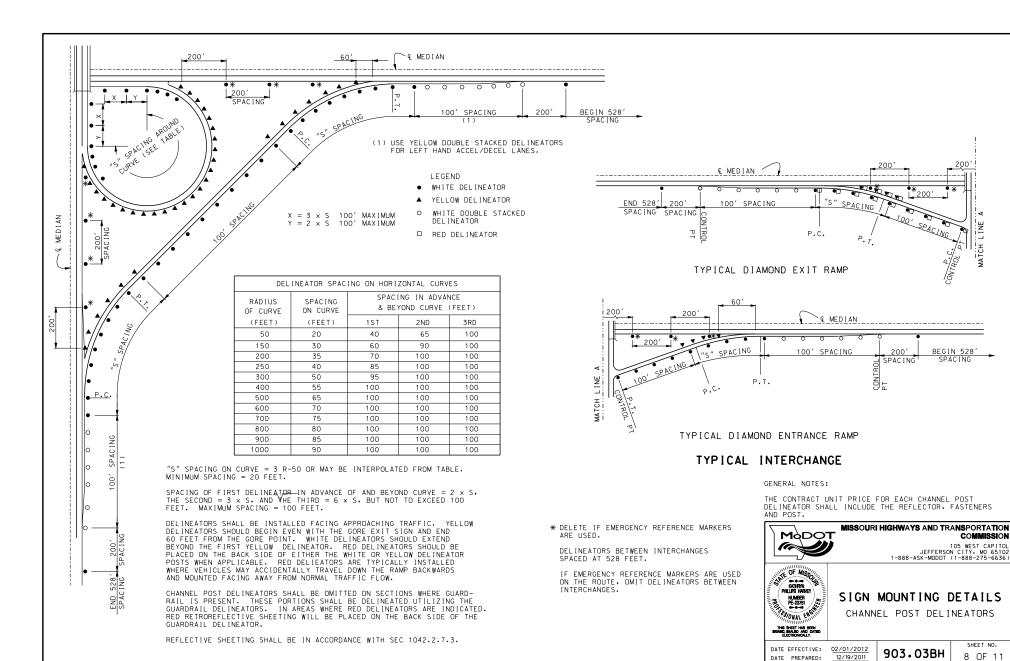
SIGN MOUNTING DETAILS

DELINEATORS OBJECT MARKERS

DATE EFFECTIVE: 02/01/2012 DATE PREPARED:

903.03BH

SHEET NO. 7 OF 11

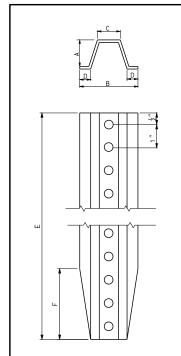


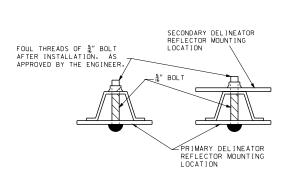
SPACING

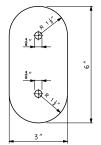
COMMISSION

SHEET NO.

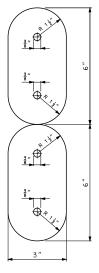
8 OF 11







CHANNEL POST DELINEATOR REFLECTOR



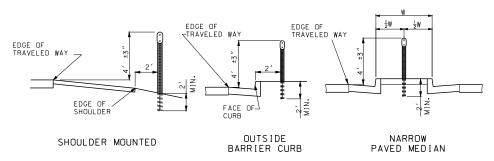
DOUBLE STACKED CHANNEL POST DELINEATOR REFLECTOR

DELINEATOR POST DIMENSIONS - INCHES LBS/FT LIMITS (2) NOMINAL 1.12 2 4 84 TOLERANCE ± 5% ± 🛔 ± | ± 1/8 ± 📙 ±1 ± 1/4

(2) WEIGHT BEFORE GALVANIZING OR PUNCHING.

HOLE PUNCHING TO EQUAL &" DIAMETER HOLES, ONE INCH CENTER TO CENTER. BEGINNING ONE-HALF INCH FROM THE END AND CONTINUING THE ENTIRE LENGTH OF

DELINEATOR POST AND FASTENER DETAILS



DELINEATOR MOUNTING DETAILS

GENERAL NOTES:

RETROREFLECTIVE YELLOW, WHITE OR RED SHEETING IN ACCORDANCE WITH ASTM D 4956 TYPE 5 OR 8 SHALL BE APPLIED TO ONLY ONE SIDE OF THE CHANNEL POST DELINEATOR MOUNTED TOWARDS THE CHANNEL POST.

REFLECTIVE SHEETING SHALL FOLLOW GUIDELINES OUTLINED IN SEC 1042-2.7 FOR CORRECT APPLICATION OF SHEETING TO DELINEATOR BODY. THE COLOR OF THE SHEETING SHALL MATCH THE CLOSEST ADJACENT PAVEMENT MARKING. A DELINEATOR WITH RED SHEETING SHALL BE THE DELINEATION IS PLACED ALONG AN INTERCHANGE RAMP AND COULD BE VIEWED BY WRONG WAY TRAFFIC.



MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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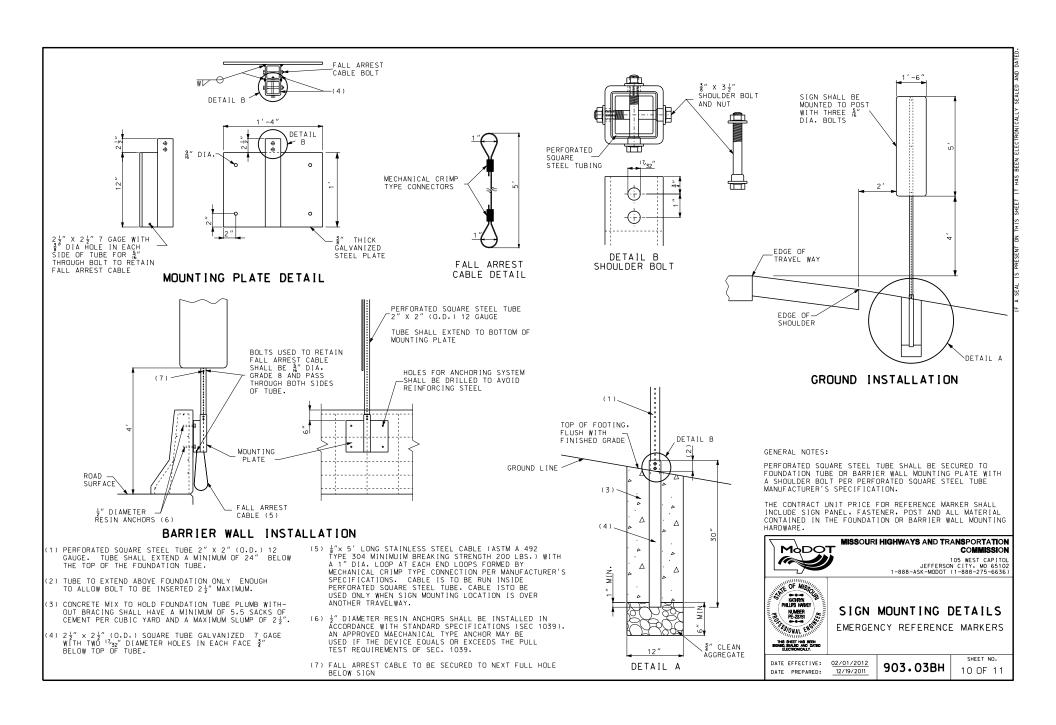
SIGN MOUNTING DETAILS

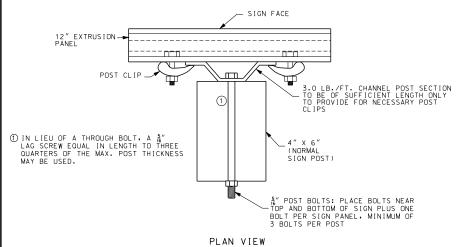
CHANNEL POST DELINEATORS

DATE EFFECTIVE: 02/01/2012 DATE PREPARED:

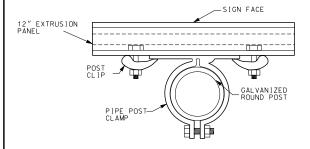
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SHEET NO. 9 OF 11





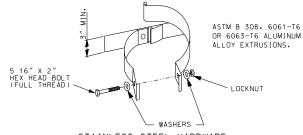
MOUNTING DETAILS FOR EXTRUDED PANELS ON WOOD 4" X 6" POST



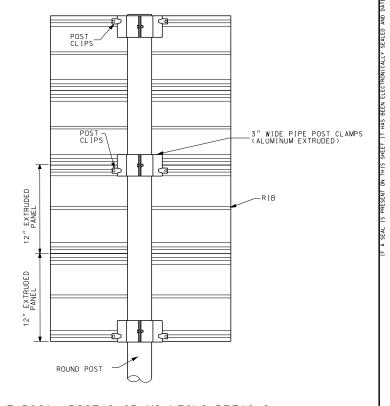
PLAN VIEW

MOUNTING DETAILS FOR EXTRUDED PANELS ON ROUND PIPE POST

ATTACH ST	F BOLTS TO EEL CHANNEL IOD POST					
SIGN HEIGHT	NO. OF BOLTS* PER WOOD POST USED					
1 ′	2					
2′	3					
3′	4					
4 ′	5					
5′	6					
6′	7					
7′	8					
*LAG SCREWS M	AY BE SUBSTITUTED					



STAINLESS STEEL HARDWARE CLAMP TYPE SIGN SUPPORT FOR PIPE POST



TYPICAL POST CLIP MOUNTING DETAILS FOR ROUND PIPE POSTS

GENERAL NOTES:

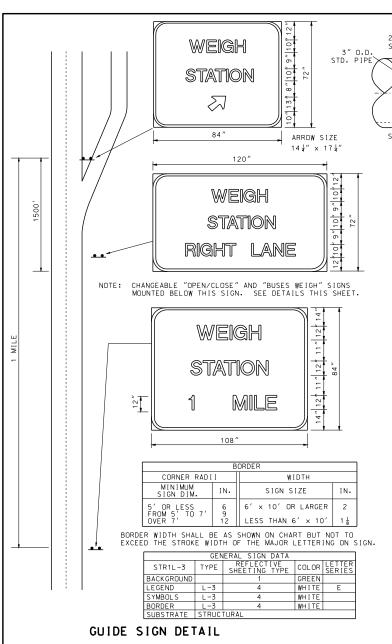


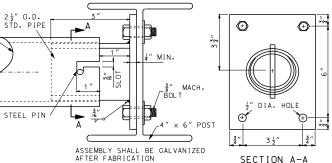
FOR SIGNS 30 SQ. FT. OR SMALLER SHEET NO.

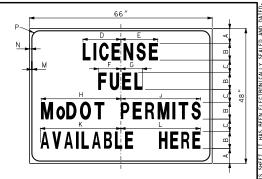
DATE PREPARED:

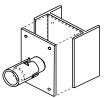
903.03BH

11 OF 11









PLAN VIEW

GENERAL SIGN DATA REFLECTIVE SHEETING TYPE COLOR LETTER TYPE SHR1L-1 BACKGROUND WHITE

4 ½" 13 ½" 13 ½"

EGEND

SYMBOLS BORDER

SUBSTRATE SHEET

В С D Ε

6"

SIGN

R21-1 5 1 "

ISOMETRIC VIEW

BUSES WEIGH MOUNTING ASSEMBLY

CLOSED

FOR OPEN AND CLOSED SIGN SEE SPECIAL PROVISIONS

BUSES WEIGH	A B C B A	A = B = C =
54"		

MAXIMUM HEIGHT FROM BOTTOM OF BUSES WEIGH SIGN TO GROUND SHALL BE 60".

	GENERAL SIGN DATA						
SHR1L-3	TYPE	REFLECTIVE SHEETING TYPE	COLOR	LETTER SERIES			
BACKGROUND		1	GREEN				
LEGEND	L-3	4	WHITE	E			
SYMBOLS							
BORDER	L-3	4	WHITE				
SUBSTRATE	SHEET						

CHANGEABLE SIGN DETAIL

SUBSTRATE ST STRUCTURAL SH SHEET

LEGEND, SYMBOLS, & BORDER L-1 SCREEN PRINT L-3 DIRECT APPLIED (CUT FROM

MATERIAL SHOWN ON PLANS.)

REFLECTIVE SHEETING R1 ENGINEERING GRADE IN ACCORDANCE WITH SEC 1042.2.7.1 R4 PRISMATIC IN ACCORDANCE WITH SEC 1042.2.7.3

PERMIT SIGN DETAIL

G Н J

L-1

	MATERIAL LIST	
NO.	DESCRIPTION	LB.
2	4" STEEL PLATE	2.26
	3" STANDARD PIPE	32.44
	2-1/2" STANDARD PIPE	3.89
	ỗ″ GALV, MACH, BOLT	
8	GALV. WASHER	

GENERAL NOTES:

DESIGN SPECS: AASHTO STANDARD SPECIFCATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINARES, AND TRAFFIC SIGNALS - 1975.

MATERIALS AND FABRICATION SHALL CONFORM TO THE REQUIREMENTS OF THE STATE HIGHWAY AND TRANSPORTATION COMMISSION STANDARD SPECIFICATIONS AND PROVISIONS.



MODOT

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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HIGHWAY SIGNING

WEIGH STATION

DATE EFFECTIVE: 02/01/2012 DATE PREPARED:

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SHEET NO. 1 OF 1

Р

N

5" 3 "

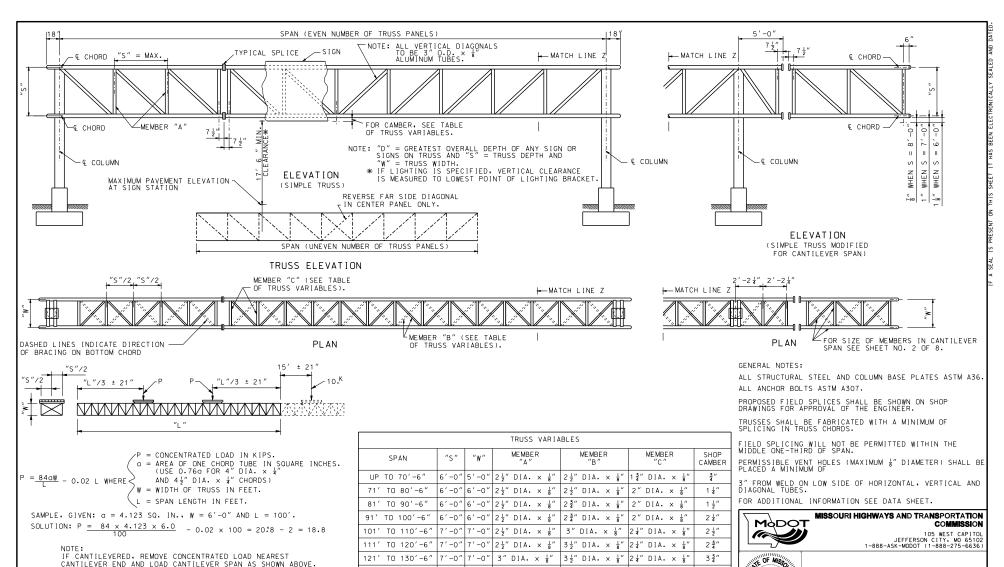
М

BLACK

BLACK

K L

7 % 28 % 28 % 28 % 28 % 28 % 28 %



REPEAT ABOVE TESTS BY ROTATING 180° (TO SIMULATE WIND REVERSAL). NO VERTICAL LOAD (D.L.) TEST WILL BE REQUIRED. 151' TO 160'-6" 8'-0" 7'-0" | 3" DIA. $\times \frac{1}{8}$ " | 3 $\frac{3}{4}$ " DIA. $\times \frac{1}{8}$ " | 2 $\frac{3}{4}$ " DIA. $\times \frac{1}{8}$ " FOR SIZE OF CHORD MEMBERS, SEE DATA SHEET. SHOP CAMBER MAY BE PARABOLIC OR STRAIGHT, BUT SHALL BE SYMMETRICAL ABOUT CENTERLINE OF SPAN.

7'-0"

3" DIA. $\times \frac{1}{8}$ "

3" DIA. x ⅓"

8'-0"

141' TO 150'-6" |8'-0" |7'-0"

131' TO 140'-6"

15' OR LESS CANTILEVER SPANS NEED NOT BE TESTED.

LOADS P SHALL NOT BE MORE THAN 16° FOR SPANS LESS

SIMULATED WIND-SHOP TEST LOADING

THAN 55 FEET AND 20°. FOR ALL OTHERS.

3¾" DIA. × ⅓"



3"

3 3 "

4 ½"

 $2\frac{1}{2}$ " DIA. $\times \frac{1}{8}$ "

| 3¾" DIA. × ¼" |2¾" DIA. × ¼"

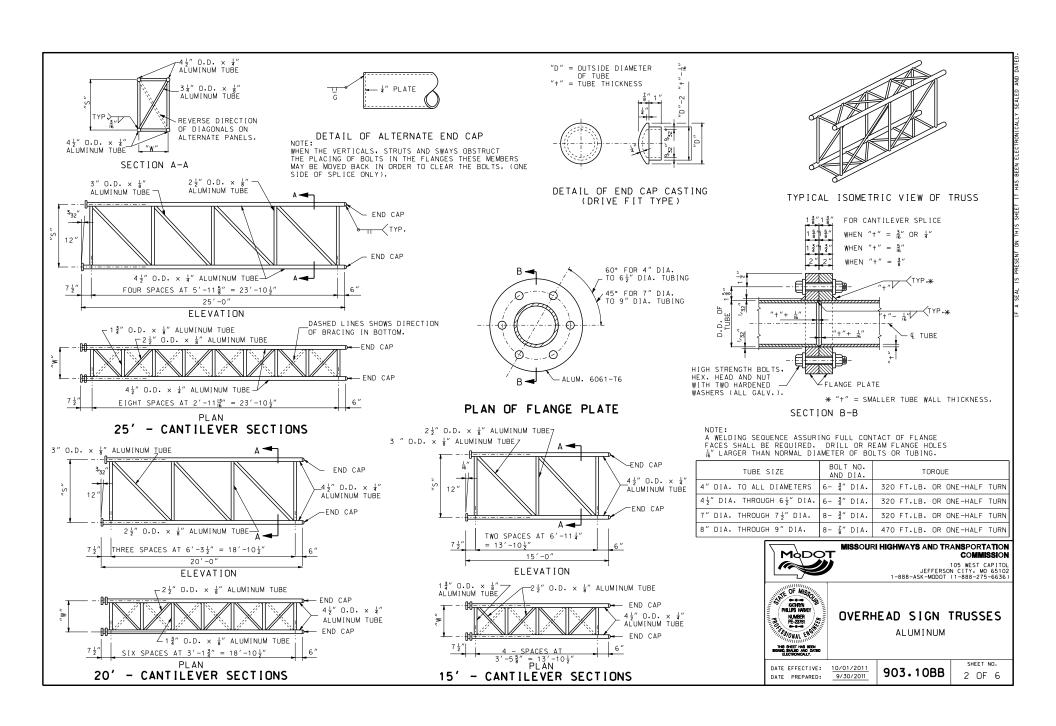
OVERHEAD SIGN TRUSSES

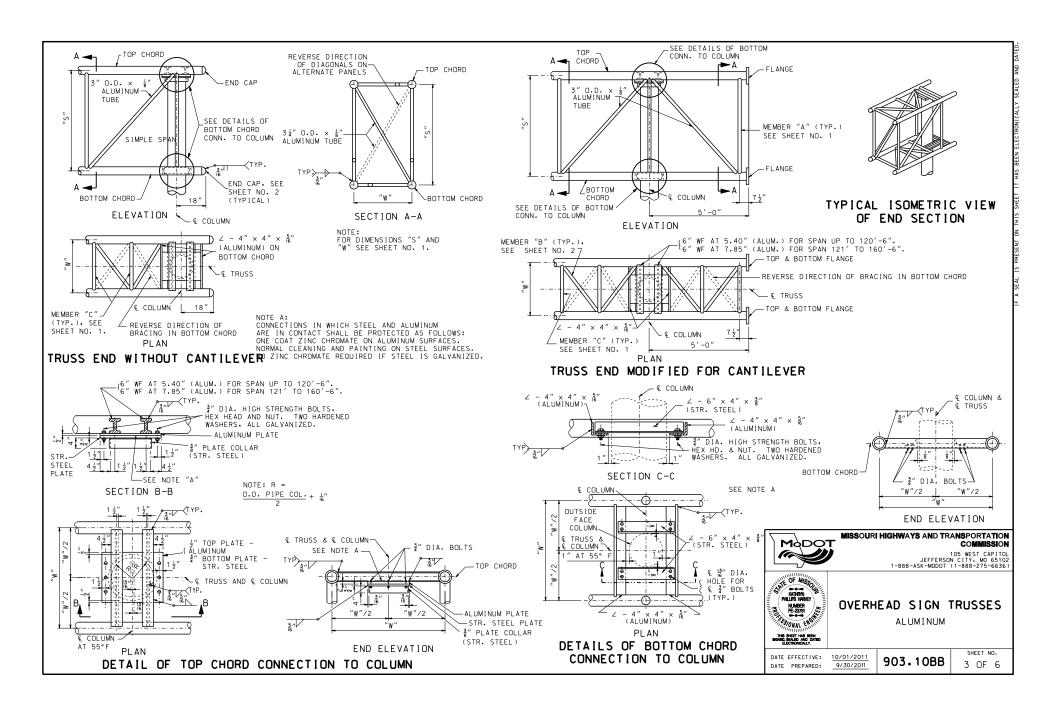
ALUMINUM

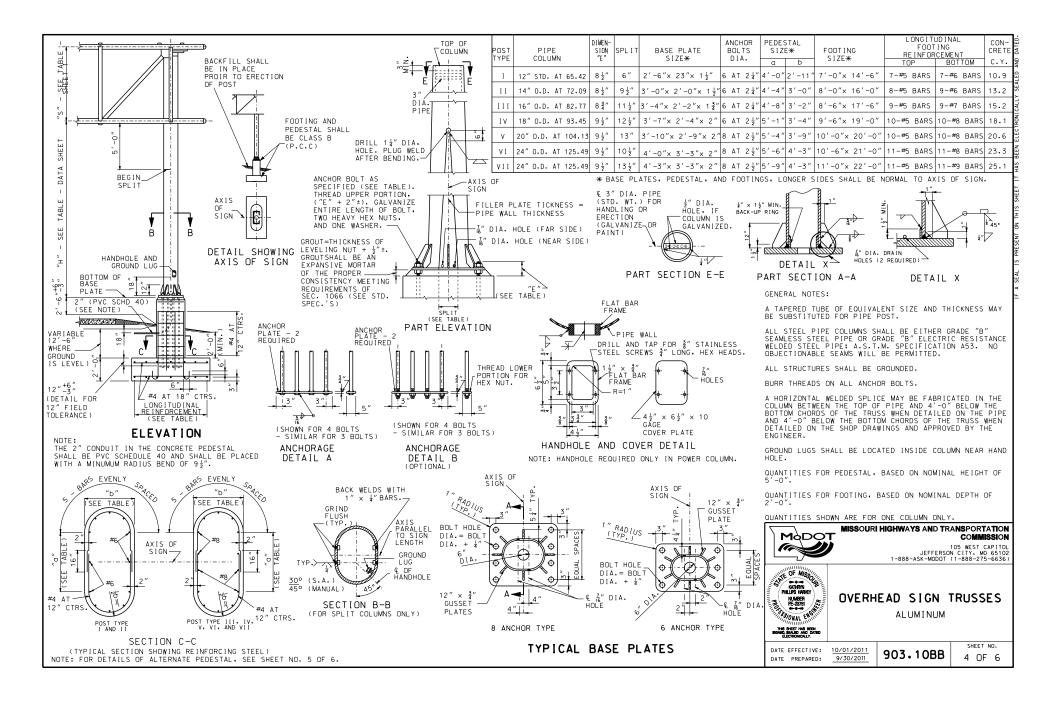
DATE EFFECTIVE: 10/01/2011 DATE PREPARED:

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SHEET NO. 1 OF 6







POST TYPE	PIPE		STAL E *	FOOTING SIZE *	F00	TUDINAL TING RCEMENT		RETE Y.
	002011111	С	d	3122	TOP	воттом	MEDIAN BARRIER	MEDIAN BARRIER
I	12" STD. AT 65.42	5′-9″	2'-1"	7'-0" × 14'-6"	7 - #5 BARS	7 - #6 BARS	10.9	11.6
ΙΙ	14" O.D. AT 72.09	6′-2″	2'-2"	8'-0" × 16'-0"	8 - #5 BARS	9 - #6 BARS	13.2	14.0
III	16" O.D. AT 82.77	6′-7″	2'-4"	8'-6" × 17'-6"	9 - #5 BARS	9 - #7 BARS	15.2	16.1
ΙV	18" O.D. AT 93.45	7′-1″	2'-6"	9'-6" x 19'-0"	10 - #5 BARS	10 - #8 BARS	18.1	19.1
٧	20" O.D. AT 104.13	7′-8″	2'-11"	10'-0" × 20'-0"	10 - #5 BARS	10 - #8 BARS	20.6	21.7
VΙ	24" O.D. AT 125.49	8'-3"	3′-5″	10'-6" × 21'-0"	11 - #5 BARS	11 - #8 BARS	23.3	24.6
VII	24" O.D. AT 125.49	8′-6″	3′-5″	11'-0" x 22'-0"	11 - #5 BARS	11 - #9 BARS	25.1	26.5

* BASE PLATES, PEDESTAL, AND FOOTINGS LONGER SIDES SHALL BE NORMAL TO AXIS OF SIGN.

GENERAL NOTES:

PART ELEVATION (TYPE A CONCRETE TRAFFIC BARRIER)

#4 BARS (SPACED AS SHOWN

SIS Α¥

#4 BARS (SPACED AS SHOWN IN ELEVATION)

IN ELEVATION)

#4 AT 18" CTRS.

d + 18"

- #6 BARS

#6 BARS-

- #6 BARS

POST TYPE

I AND II

d + 2" 8" 3" (TYP. 2" CONDUIT (TYP.) (PVC SCHEDULE 40) (SEE NOTE) #6 OR #8 BARS (TYP.)_ (SEE SECTION C-C) c♥ CONST. JT LONGITUDINAL REINFORCING (SEE TABLE) #4 AT 18" CTRS.

THE 2" CONDUIT IN THE CONCRETE PEDESTAL SHALL

MIN. RADIUS BEND OF 91".

5 - #8 BARS POST TYPE III. IV. V. VI. AND VII

d + 18"

#8 BARS-

5 - #8 BARS

SECTION C-C TYPICAL SECTION SHOWING REINFORCING STEEL

DETAILS OF ALTERNATE PEDESTAL

(TO BE USED ADJACENT TO TYPE "A" OR "C" MEDIAN BARRIER)

BE PVC SCHEDULE 40 AND SHALL BE PLACED WITH A

A TAPERED TUBE OF EQUILVALENT SIZE AND THICKNESS MAY BE SUBSTITUTED FOR PIPE POST.

ALL STEEL PIPE COLUMNS SHALL BE EITHER GRADE "B" SEAMLESS STEEL PIPE OR GRADE "B" ELECTRIC RESISTANCE WELDED STEEL PIPE; A.S.T.M. SPECIFICATION

NO OBJECTIONABLE SEAMS WILL BE PERMITTED.

ALL STRUCTURES SHALL BE GROUNDED.

BURR THREADS ON ALL ANCHOR BOLTS.

PIPE COLUMN, BASE PLATE, ANCHOR BOLTS AND NOTES PERTAINING TO THESE ITEMS HAVE BEEN OMITTED FOR CLARITY, REFER TO SHEET NO. 4 OF 6 FOR DETAILS OF

GROUND LUGS SHALL BE LOCATED INSIDE COLUMN NEAR HAND

OUANTITIES FOR PEDESTAL, BASED ON NOMINAL HEIGHT OF 5'-2" (TYPE A MEDIAN BARRIER) OR 6'-0" (TYPE C MEDIAN BARRIER).

QUANTITIES FOR FOOTING, BASED ON NOMINAL DEPTH OF

QUANTITIES SHOWN ARE FOR ONE COLUMN ONLY.



MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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OVERHEAD SIGN TRUSSES

ALUMINUM

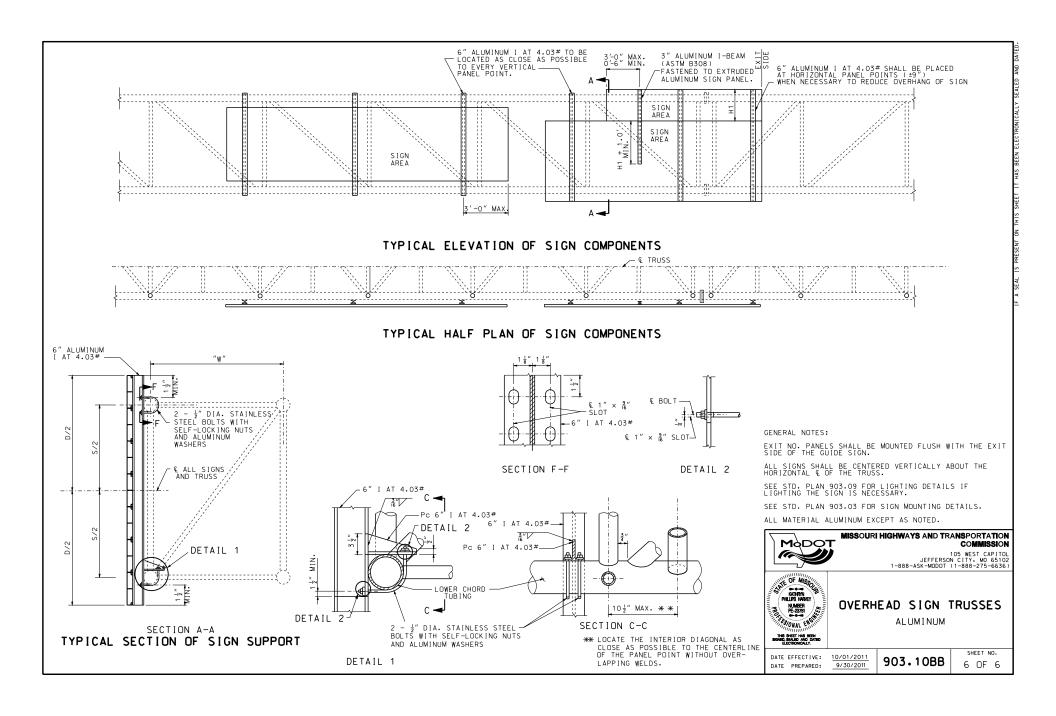
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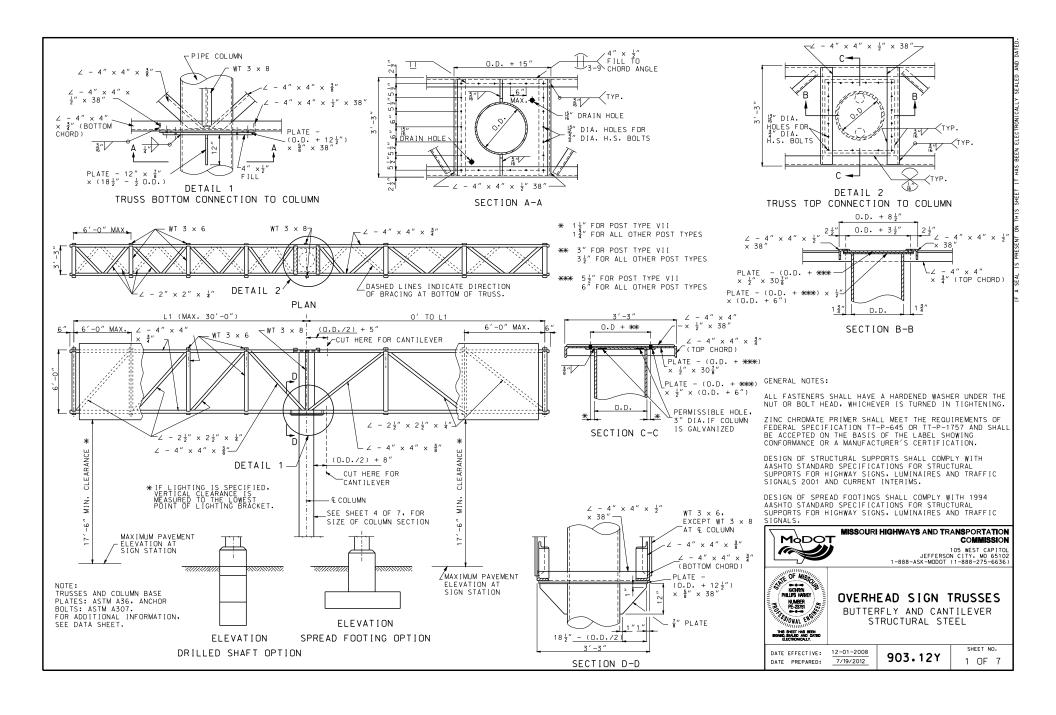
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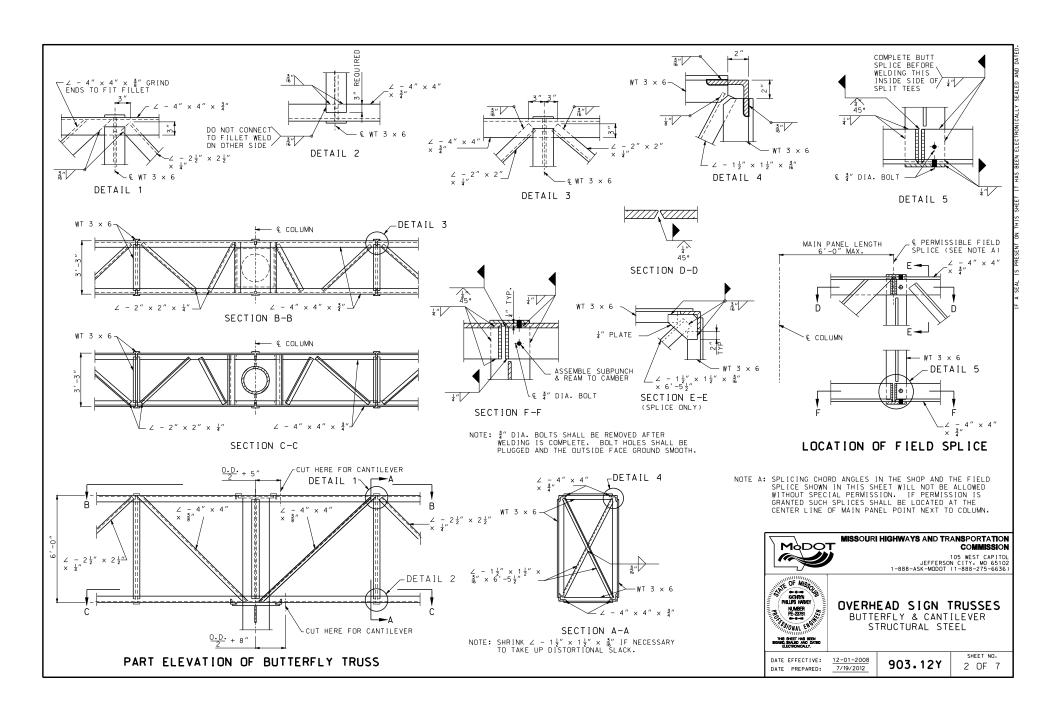
5 OF 6

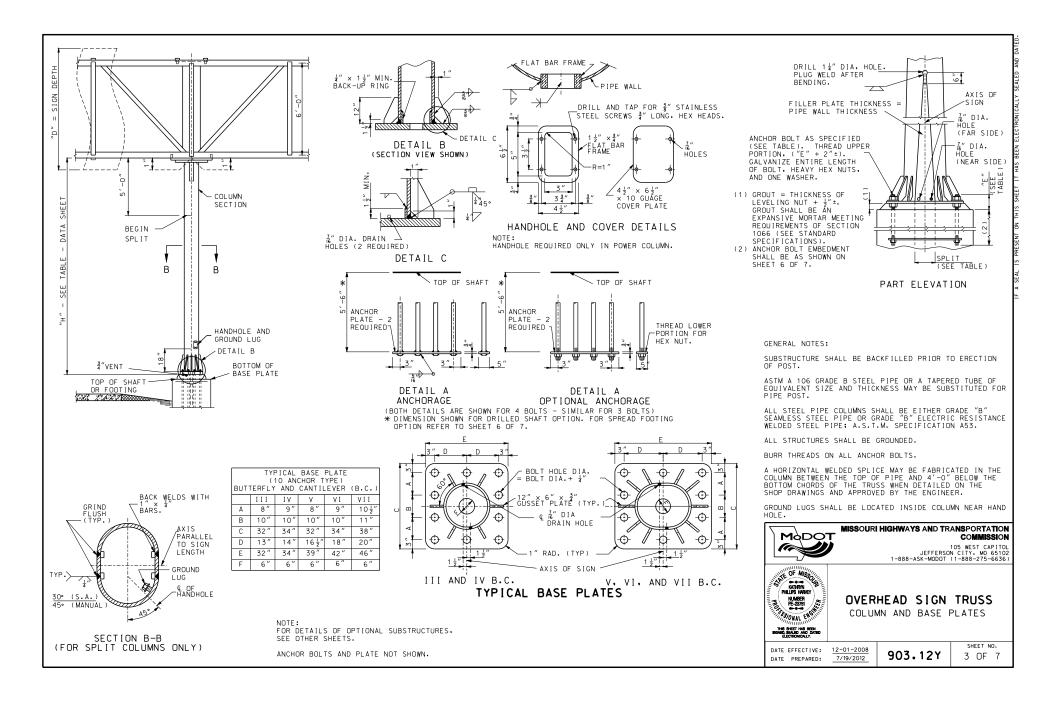
SHEET NO.

PART ELEVATION (TYPE C CONCRETE TRAFFIC BARRIER)









	DRILLED SHAFT OPTION															ALTE	RNATE	PEDES	STALS										
				BASE PLATE	ANCH BOL		_	F.4					MOME	COLLA NT-C1		ORCEMENTAR-C2	T SKIN	1-C3	SHA LONGITU		SHEA	R-S2	REBAR	CON-	REBAR TOTAL (LBS.)		CONC		
I,		(LBS.)	E.		SIZE**	NO. [FA		FC	· -	FH	_	SPACING	BARS	SPACING	BARS	SPACING	S. QUANTIT	1 Y BARS	BARS	SPACING	TOTAL (LBS.)	CRETE (CU.YDS.)	TYPE A	TYPE C	TYPE A	TYPE C
I	II 18"	93.45	8 ½"	0"	2'-8" x 2'-8" x 1	10	2" 2	2′-10″	4′-0″	7′-6″	1 '-6 "	4'-6"	14′-0′	#6	6"	#4	12"	#4	12"	19	#10	#5	6"	2126	12.4	2066	2077	13.4	14.5
	V 20"	104.13	8 ½"	0"	2'-10" x 2'-10" x	10	2 ¼"	3′-0"	4′-0″	7′-6″	1 '-6 "	4'-6"	14'-0'	#6	6"	#4	12"	#4	12"	19	#10	#5	6"	2126	12.4	2066	2077	13.5	14.6
	V 18"	93.45	8 ½"	7 "	3'-3" × 2' -8" × 2	″ 10	2 4" 2	2′-10″	5′-0″	13′-6′	4'-0"	5′-6″	17′-0′	#6	6"	#4	12"	#4	12"	22	#11	#6	6"	3901	26.5	3763	3782	28.8	30.7
	/I 20"	104.13	8 ½"	8 "	3'-6' x 2'-10" x 2	å" 10	2 4"	3′-0"	5′-0″	14'-0'	4'-0"	6'-0"	18′-0′	#6	6"	#4	12"	#4	12"	27	#11	#6	6"	4742	31.8	4528	4547	34.1	36.2
_	II 24"	125.49	9"	8 "	3'-10" × 3'-2" × 2	å″ 10	2 ½"	3′-4″	5′-0″	14'-0'	4'-0"	6'-0"	18′-0′	#6	6"	#4	12"	#4	12"	27	#11	#6	6"	4742	31.8	4528	4547	34.5	36.8

	SPREAD FOOTING OPTION																			
POS"	г	PIPE DLUMN	"r. "	SPL I T	BASE PLATE		CHOR OL T		ESTAL ZE *	FOOTING		I TUD I N E I NF OF		OT I NG NT		PEDES REINFORG				CON- CRETE
TYPE	O.D.	WEIGHT	E		SIZE**	NO.	DIA	. a	Ь	SIZE *	NO.	OP BARS	BOT NO.	TOM BARS	NO.	BARS	NO.	BARS	TOTAL	(CU.YDS.)
HII	18"	93.45	8 ½ "	0"	2'-8" x 2'-8" x 134"			4'-2"		10'-0" × 13'-0"	10	#5	10	#5	10	#4	14	#8	695	14.4
ΙV	20"	104.13	8 ½"	0"	2'-10" x 2'-10" x 2"	10	2 4"	4'-4"	3′-10″	10'-0' × 14'-0"	10	#5	10	#5	10	#4	14	#8	733	15.6
٧	18"	93.45	8 ½"	7 "	3'-3" × 2' -8" × 2"	10	2 4"	4'-9"	3′-8″	9′-0″ × 17′-0″	9	#5	10	#7	10	#4	14	#8	955	16.5
٧I	20"	104.13	8 ½"	8 "	3'-6' x 2'-10" x 2 4"	10	2 4"	5′-0″	3'-10"	9'-0" x 19'-0"	9	#5	10	#7	10	#4	14	#8	1028	18.4
VII	24"	125.49	9"	8 "	3'-10" × 3'-2" × 2¼"	10	2 ½"	5′-4″	4′-2″	10'-0" × 20'-0"	9	#5	12	#7	10	#4	14	#8	1196	21.5

	SPREAD FOOTING OPTION WITH ALTERNATE PEDESTALS																															
PO TY		PIPE COLUN	MN	"E "	SPL I T	BASE PLATE SIZE**		ANCHO BOL T		EDESTA SIZE *	L	FOOTING SIZE *		PE A LO TING RE	INFOR			PE A EINFO			TYPE A REBAR TOTAL	TYPE A CONCRETE	TYPE FOOTIN				T Y P RE	E C I	RCEMI		TYPE (REBAR TOTAL	
	-		BS.)					NO.DI	4. c	d	е		NO.	BARS	NO.	BARS	NO.	BARS	NO.	BARS	(LBS.)	(CU.YDS.)	NO.	BARS			NO.	BARS	NO.	BARS	(LBS.)(CU.YDS.)
I	I I 1	18" 93	3.45	8 ½"	0"	2'-8" × 2'-8" ×	< 1 ³ / ₄ "	10 2	2′-10	6'-6"	15"	10'-0" × 13'-0	" 10	#5	10	#5	10	#4	14	#8	757	14.4	10	#4	10	#5	12	#4	14	#8	800	15.3
I	V 2	20" 10	4.13	8 ½"	0"	2'-10" x 2'-10"	x 2"	10 2 4	″ 3′-0"	6'-9"	18"	10'-0' x 14'-0	″ 10	#5	10	#5	10	#4	14	#8	795	15.6	10	#4	10	#5	12	#4	14	#8	839	16.5
,	V 1	18" 93	3.45	8 ½"	7 "	3'-3" × 2' -8" >	x 2"	10 2 4	″ 2 <i>′</i> -10	7'-0"	12"	9'-0" x 17'-0	″ 9	#5	10	#7	10	#4	14	#8	1015	16.5	10	#4	10	#7	12	#4	14	#8	1059	17.5
V	/I 2	20" 10	4.13	8 ½"	8 "	3'-6' x 2'-10" x	⟨2¼″	10 2 4	″ 3′-0″	7′-6″	15"	9'-0" x 19'-0	″ 9	#5	10	#7	10	#4	14	#8	1099	18.4	10	#4	10	#7	12	#4	14	#8	1134	19.5
٧	II 2	24" 12	5.49	9″	8″	3'-10" × 3'-2" ×	⟨2¼″	10 2 ½	″ 3′-4″	7′-10″	15"	10'-0" × 20'-0	″ 9	#5	12	#7	10	#4	14	#8	1257	21.5	10	#4	12	#7	12	#4	14	#8	1302	22.6

** BASE PLATES, PEDESTAL AND FOOTINGS, LONGER SIDES SHALL BE NORMAL TO AXIS OF SIGN. *** BASE PLATES, PEDESTAL AND FOUNDATIONS, LONGER SIDES SHALL BE NORMAL TO AXIS OF SIGN.



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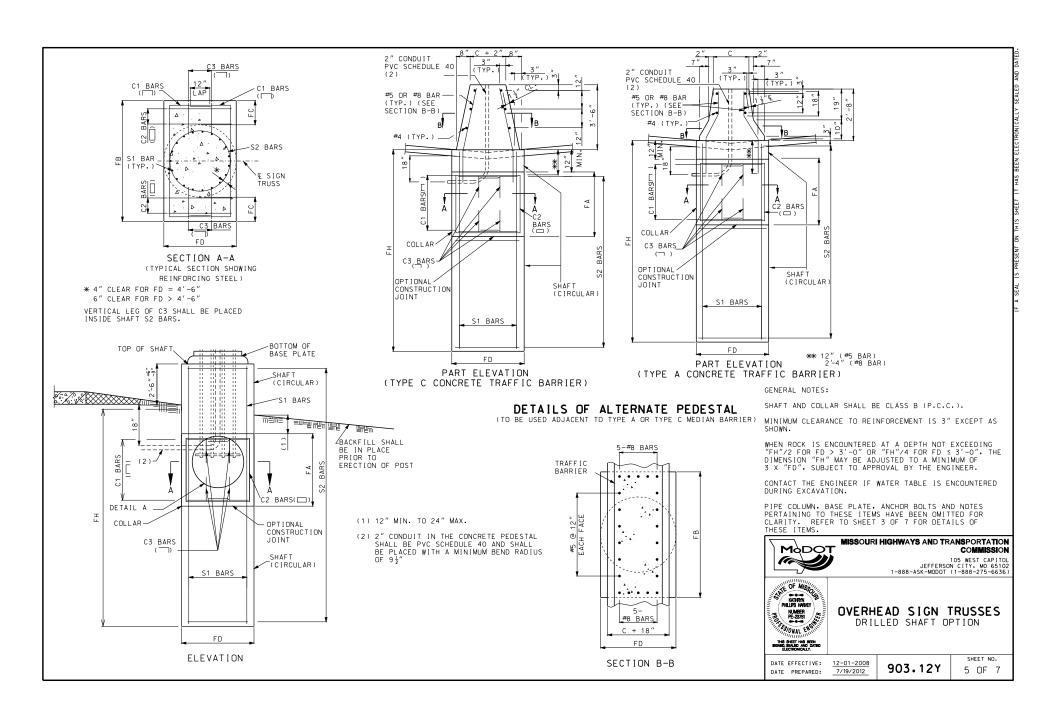


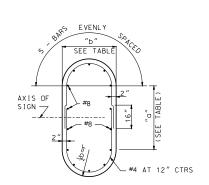
OVERHEAD SIGN TRUSSES OPTIONAL SUBSTRUCTURE DATA

DATE EFFECTIVE: 12-01-2008 DATE PREPARED: 7/19/2012

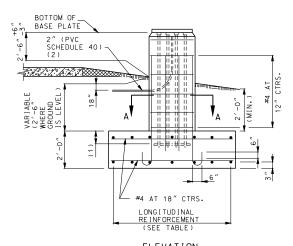
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SHEET NO. 4 OF 7



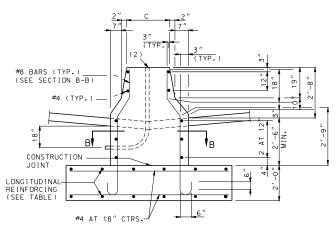


SECTION A-A (TYPICAL SECTION SHOWING REINFORCING STEEL)

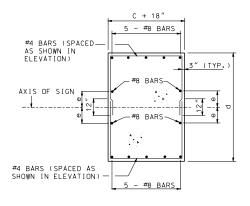


ELEVATION

- (1) 12"+6" (DETAIL FOR 12" FIELD TOLERANCE)
- (2) 2" CONDUIT IN THE CONCRETE PEDESTAL SHALL BE PVC SCHEDULE 40 AND SHALL BE PLACED WITH A MINUMUM BEND RADIUS OF 9½".

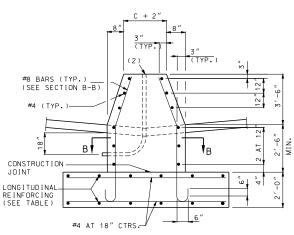


PART ELEVATION (TYPE A CONCRETE TRAFFIC BARRIER)



SECTION B-B TYPICAL SECTION SHOWING REINFORCING STEEL

DETAILS OF ALTERNATE PEDESTAL



PART ELEVATION (TYPE C CONCRETE TRAFFIC BARRIER)

GENERAL NOTES:

PEDESTAL AND FOOTING SHALL BE CLASS B (P.C.C.).

MINIMUM CLEARANCE TO REINFORCEMENT IS 3" EXCEPT AS

CONTACT THE ENGINEER IF WATER TABLE IS ENCOUNTERED DURING EXCAVATION.

PIPE COLUMN, BASE PLATE, ANCHOR BOLTS AND NOTES PETAINING TO THESE ITEMS HAVE BEEN OMITTED FOR CLARITY. REFER TO SHEET 3 OF 7 FOR DETAILS OF THESE



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OVERHEAD SIGN TRUSSES

SPREAD FOOTING

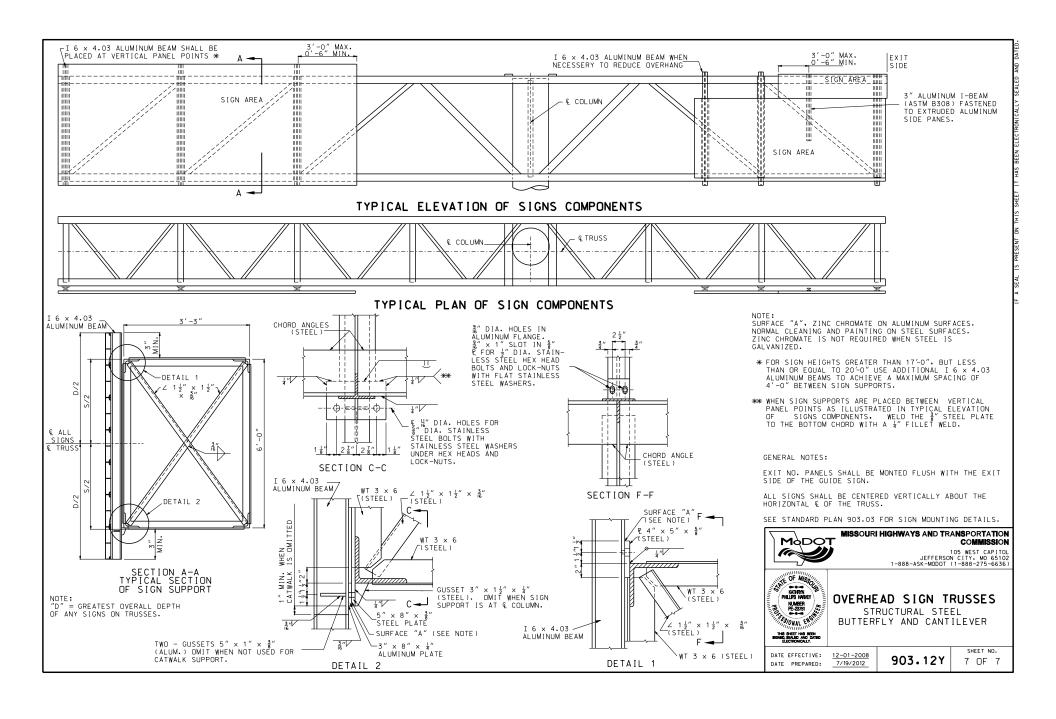
DATE EFFECTIVE: DATE PREPARED:

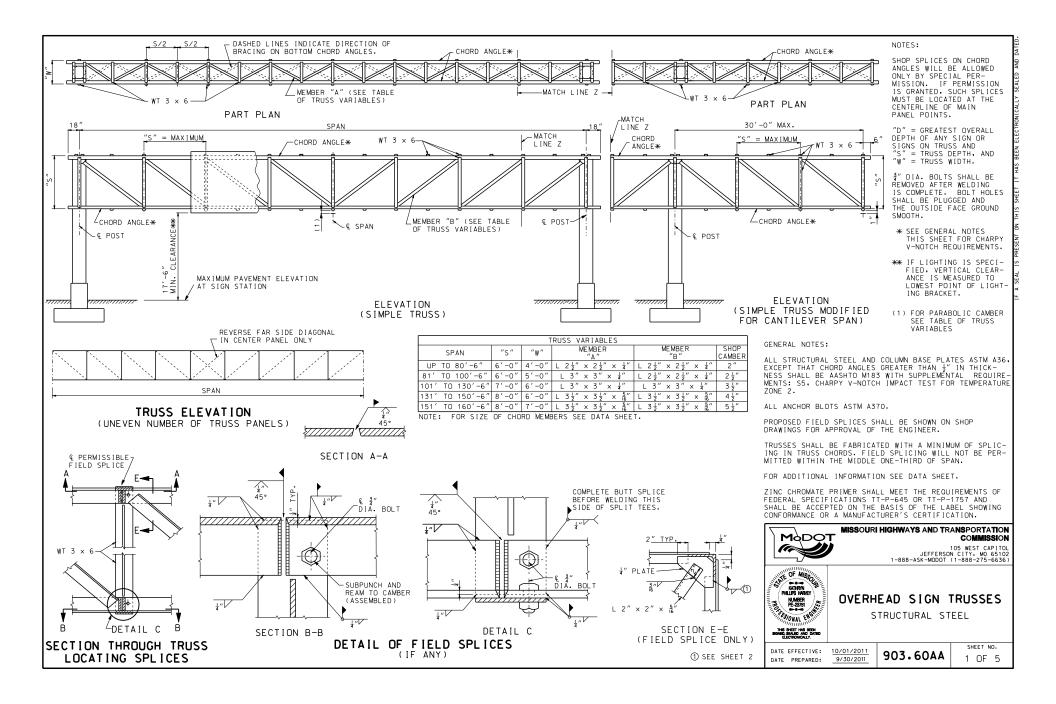
12-01-2008 7/19/2012

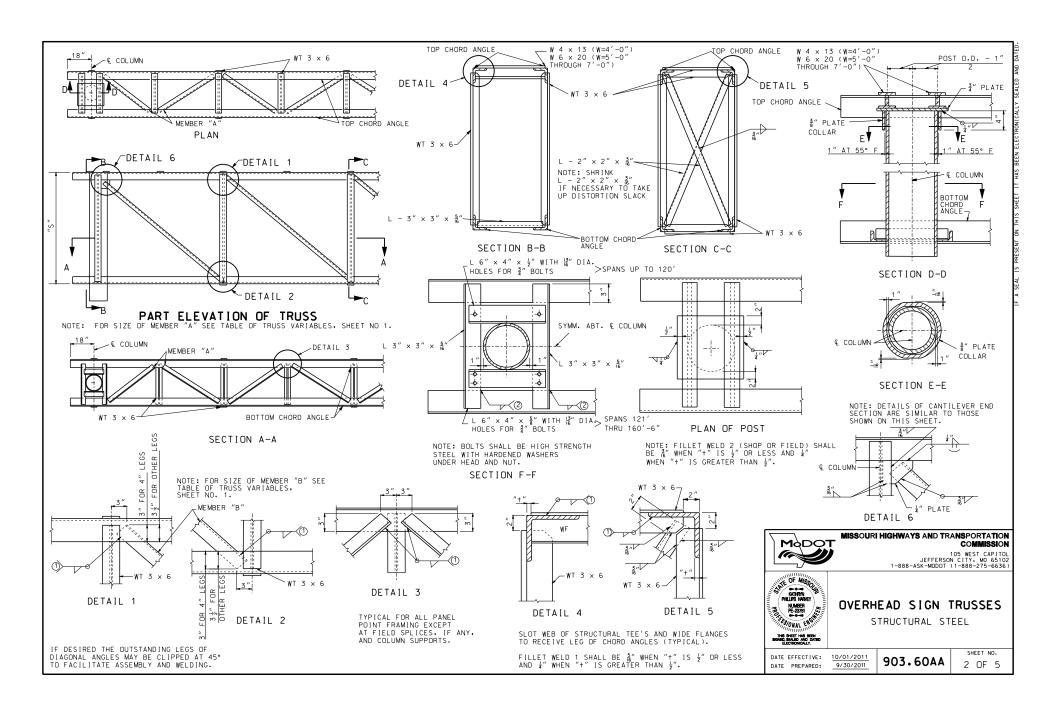
903.12Y

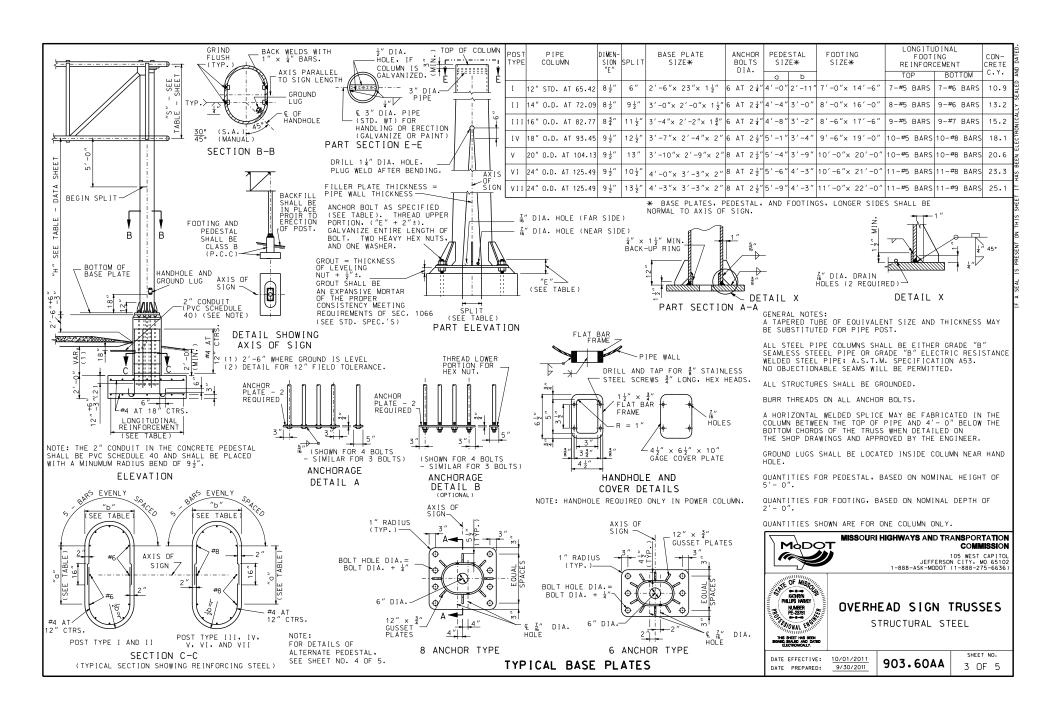
SHEET NO. 6 OF 7

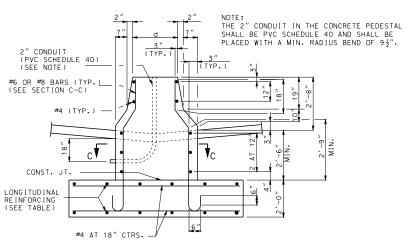
COMMISSION







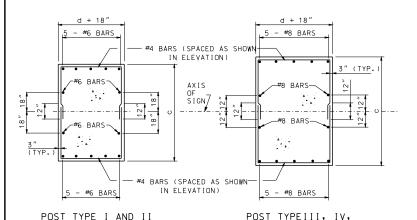




	POST TYPE			ESTAL ZE*	FOOTING SIZE*	F00	UDINAL TING RCEMENT		TYPE C
L		00201111	С	d	V.22	TOP	воттом	BARRIER	BARRIER
	I	12" STD. AT 65.42	5′-9″	2'-1"	7'-0"× 14'-6"	7-#5 BARS	7-#6 BARS	10.9	11.6
	ΙΙ	14" O.D. AT 72.09	6'-2"	2'-2"	8'-0"× 16'-0"	8-#5 BARS	9-#6 BARS	13.2	14.0
	HH	16" O.D. AT 82.77	6'-7"	2'-4"	8'-6"× 17'-6"	9-#5 BARS	9-#7 BARS	15.2	16.1
	ΙV	18" O.D. AT 93.45	7′-1″	2'-6"	9'-6"× 19'-0"	10-#5 BARS	10-#8 BARS	18.1	19.1
	٧	20" O.D. AT 104.13	7′-8″	2'-11"	10'-0"× 20'-0"	10-#5 BARS	10-#8 BARS	20.6	21.7
	۷I	24" O.D. AT 125.49	8'-3"	3′-5″	10'-6"× 21'-0"	11-#5 BARS	11-#8 BARS	23.3	24.6
ſ	VII	24" O.D. AT 125.49	8'-6"	3′-5″	11'-0"× 22'-0"	11-#5 BARS	11-#9 BARS	25.1	26.5

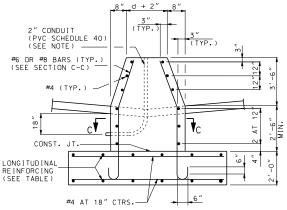
* BASE PLATES, PEDESTAL, AND FOOTINGS LONGER SIDES SHALL BE NORMAL TO AXIS OF SIGN.

PART ELEVATION (TYPE A CONCRETE TRAFFIC BARRIER)



SECTION C-C TYPICAL SECTION SHOWING REINFORCING STEEL

THE 2" CONDUIT IN THE CONCRETE PEDESTAL SHALL BE PVC SCHEDULE 40 AND SHALL BE PLACED WITH A MIN. RADIUS BEND OF 91".



PART ELEVATION (TYPE C CONCRETE TRAFFIC BARRIER)

DETAILS OF ALTERNATE PEDESTAL

V. VI. AND VII

(TO BE USED ADJACENT TO TYPE "A" OR "C" MEDIAN BARRIER)

GENERAL NOTES:

A TAPERED TUBE OF EQUILVALENT SIZE AND THICKNESS MAY BE SUBSTITUTED FOR PIPE POST.

ALL STEEL PIPE COLUMNS SHALL BE EITHER GRADE "B" SEAMLESS STEEL PIPE OR GRADE "B" ELECTRIC RESISTANCE WELDED STEEL PIPE: A.S.T.M. SPECIFICATION A53.

NO OBJECTIONABLE SEAMS WILL BE PERMITTED.

ALL STRUCTURES SHALL BE GROUNDED.

BURR THREADS ON ALL ANCHOR BOLTS.

PIPE COLUMN. BASE PLATE. ANCHOR BOLTS AND NOTES PERTAINING TO THESE ITEMS HAVE BEEN OMITTED FOR CLARITY. REFER TO SHEET 3 OF 5 FOR DETAILS OF THESE ITEMS.

GROUND LUGS SHALL BE LOCATED INSIDE COLUMN NEAR HAND

QUANTITIES FOR PEDESTAL ARE BASED ON NOMINAL HEIGHT OF 5'-2" (TYPE A MEDIAN BARRIER) OR 6'-0" (TYPE C MEDIAN BARRIER).

QUANTITIES FOR FOOTING ARE BASED ON NOMINAL DEPTH OF 2'-0".

QUANTITIES SHOWN ARE FOR ONE COLUMN ONLY.



105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)



OVERHEAD SIGN TRUSSES

STRUCTURAL STEEL

DATE EFFECTIVE: 10/01/2011 DATE PREPARED:

903.60AA

SHEET NO. 4 OF 5

COMMISSION

